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CLAIR SPRAGUE TAPPAAN

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CLAIR SPRAGUE TAPPAAN

By William E. Colby

A RARE soul has crossed the Great Divide to join those who have gone before, and a multitude mourns his passing. Few men of our time have had such a host of devoted friends in so many walks of life. He lived a clean, upright, wholesome, and useful life, and radiated good fellowship and good feeling. No one could come within the influence of his inimitable personality without being the better for it. Few men have commanded such respect and admiration from their fellow men. He has gone from our midst; but his spirit, with all its fine and uplifting qualities, still abides with us as a constant proof of what right living will do.

* * *

Clair Sprague Tappaan was born in Baldwinsville, New York, May 14, 1878. He completed his preparation for college at the Baldwinsville Free Academy and attended the University of Michigan, and later Cornell University, where he received the degree of Bachelor of Laws. While at Cornell he played on the football team and became an "all-American" center. He was admitted to practice law in New York; but shortly came to California and opened an office in Los Angeles in 1901, forming a partnership with his brother-in-law, Force Parker. When the University of Southern California organ-

ized a law school in 1904 he became a member of its first faculty. He continued to occupy a prominent place as professor of law at that institution until 1928, when his judicial duties necessitated his retirement. He also lectured on Roman law at Loyola University, where, in 1931, there was conferred on him the honorary degree of Doctor of Laws. On August 2, 1927, he was appointed by Governor Young to the Superior Bench of Los Angeles County, and on September 15, 1928, he was elected to that office at the primaries by one of the largest votes received in the group of judicial candidates. His ability as a jurist was soon recognized, and important cases, some of them involving the City of Los Angeles, were assigned to him for hearing and decision. His judicial merit received further recognition when, on January 11, 1932, he was designated by the State Judicial Council to sit as a justice of the District Court of Appeals. The customary six-months' assignment to that bench was twice extended for three-months periods, so that he was performing those judicial duties up to the time of his death. It was characteristic of him that he "died in harness." On November 30, 1932, returning to his chambers from a luncheon of the Los Angeles Bar Association, where he had delivered an address, he passed away before he could be taken to a hospital.

His attainments as a lawyer, as a professor of law, and as a jurist were further exemplified by his studies in comparative and historical jurisprudence. He had collected in his law library many rare volumes devoted to these subjects.

In 1906 he married Mary Darling, of Los Angeles, daughter of the late Dr. Frank Darling. Their son, Francis Darling Tappaan, was graduated from the University of Southern California in 1931 and subsequently from its law school. While attending the university, Francis also played football, and, to his father's extreme delight, carried on the family tradition by being selected as an all-American end. Judge Tappaan also derived great pleasure from the fact that Francis had been made active manager of the 1930, 1931, and 1932 Sierra Club outings, and that in their conduct he had acquitted himself so ably.

During the war, Judge Tappaan went to France, where he rendered invaluable assistance in the Y. M. C. A. in charge of recreation and entertainment, so essential to the well-being of our soldiers. At Christmastime in 1918, following the armistice, he nearly gave up

his life for our common cause, having contracted pneumonia. This serious illness undoubtedly contributed to his untimely death.

Judge Tappaan took his first trip into the High Sierra in the summer of 1902. The Sierra Club outing that year was held in the Kings River Cañon, and one evening he and his companions joined our camp-fire group. To use his own words, he became convinced that "the members of the Sierra Club were the right sort," and he at once joined the club, later to participate in many of its outings. In 1905 he went with Edward T. Parsons into Paradise Park on Mount Rainier to establish camp for the Sierra Club on that memorable outing. At once he became the life of the party, and on all succeeding outings that he attended he presided at camp-fires, led in singing, devised entertaining games, and in many other ways built up a tradition of jovial good spirits. His inimitable talks on the fauna of the High Sierra will live forever in the memory of those who have been fortunate enough to hear these "scientific lectures." Who can ever forget the Roctivora, the Ring Tailed Rusticrustus, the Side Hill Guana, the Weeping Ibis, the innumerable other mental creations?

As manager of the Sierra Club outings, I owe "Tap" an obligation that is beyond my power to express in words. His advice as a member of the Outing Committee and as Assistant Manager was always invaluable, and his sharing of responsibility, particularly in times of stress, was a profoundly appreciated help. Many were the times we traveled together at night through inky-black forests, crossing rivers and climbing mountains in search of lost members of the party. Many were the times his medical knowledge (for he studied medicine before he took up law as his life work) proved to be of priceless value in cases of emergency. In 1912 he was elected a director of the Sierra Club, and he held that office up to the time of his death. For two years, 1922 to 1924, he was president of the club.

* * *

A huge Sierra camp-fire sends its myriad glowing sparks dancing up toward the stars, revealing the finest of forest tracery and lighting a circle of expectant faces. From out the mysterious shadows, into the center of the friendly light, steps a man, with bandanna wound pirate-like around his head, whose easy costume betokens long familiarity with the out-of-doors. He is greeted with spontaneous and prolonged applause, for he is the one and only "Tap," so beloved by

those who have traveled the mountain trails with the Sierra Club during the many years of its famous outings. He launches into one of his unrivaled talks—it matters not what he talks about, for, whatever the subject, he holds his audience spellbound, or convulses them with laughter.

This is, perhaps, the most vivid recollection many of us have of our beloved "Tap." But we shall never forget that above and beyond this dramatization of the jovial spirit, he stood for the finest things in life. In the Sierra Club traditions he will always typify manhood, courage, and idealism. He has added mightily to the prestige of our organization, and his passing leaves a vacancy impossible to fill.

THE OUTING OF 1932

By Hollis T. Gleason

From this hour, freedom! . . .
I inhale great draughts of space;
The east and the west are mine, and
the north and the south are mine . . .
All seems beautiful to me. . . .
Now I see the secret of the making
of the best persons,
It is to grow in the open air, and to
eat and sleep with the earth. —Whitman.

WHO can recall without a feeling of reverence the golden days spent in the High Sierra of California? For here "immortal shapes of bright aerial spirits live insphered in regions mild of calm and serene air, above the smoke and stir of this dim spot which men call earth." Here "none may come to the trial till he or she brings courage and health, and only those may come who come in sweet and determined bodies." Rejoicing here under the shadow of the great peaks, in the dazzling sunshine of the high plateaus, in all the radiant coloring of this land of the sky, we tread once more the undisturbed delightful paths of earth.

Who has not waked from peaceful slumber in the high places to see the day-star trick his beams and with new-spangled ore flame in the forehead of the morning sky? Who has not risen under the opening eyelids of the morn refreshed and primed for the unknown pleasures of a new day? Strike out on the High Sierra trail long ere the burning sun flames over yonder ridge; swish under foot the meadow-grass dew-pearled, before the shadows flee away. In silent worship marvel at the "bells and flowrets of a thousand hues," the blue clusters of lupine and larkspur, the brilliant red of the castilleia, the soft pink of the alpine shooting-star. Breathe deep the cold clear air of the morning, tune heart and soul to the music of the roaring stream as it swirls all white among the boulders; hearken to the songs of birds in the forest, lift up your eyes to the heights of glistening snow, and behold who hath created these things.

* * *

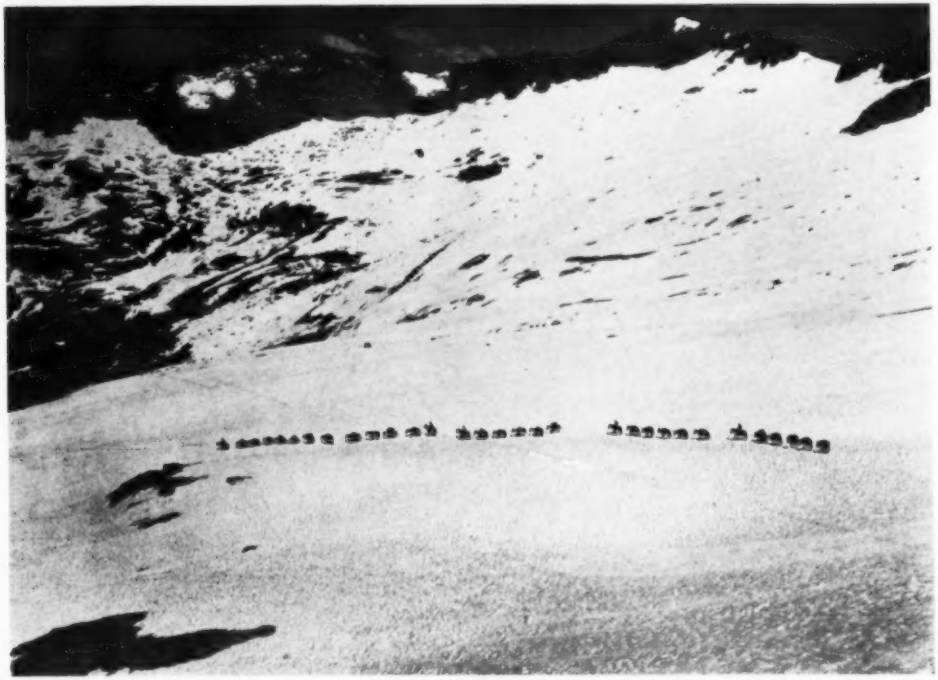
On Saturday morning, July 9, A.D. 1932, the hot discomforts of the

San Joaquin Valley and the manifold tribulations of the business depression were fast fading into oblivion; for we were rapidly ascending the tortuous and magnificent highway that leads up the Middle Fork of the Kaweah River to the serene and pellucid atmosphere of the Giant Forest. Here, at Wolverton Creek, the efficient commissary of the Sierra Club had established our first camp-site. Here for two days and nights we could either repent, or groom ourselves for the long trail to the Delectable Mountains. We were two hundred strong, or weak, as the case might be, and our repentance was reserved, if at all, for our sojourn in the wilderness.

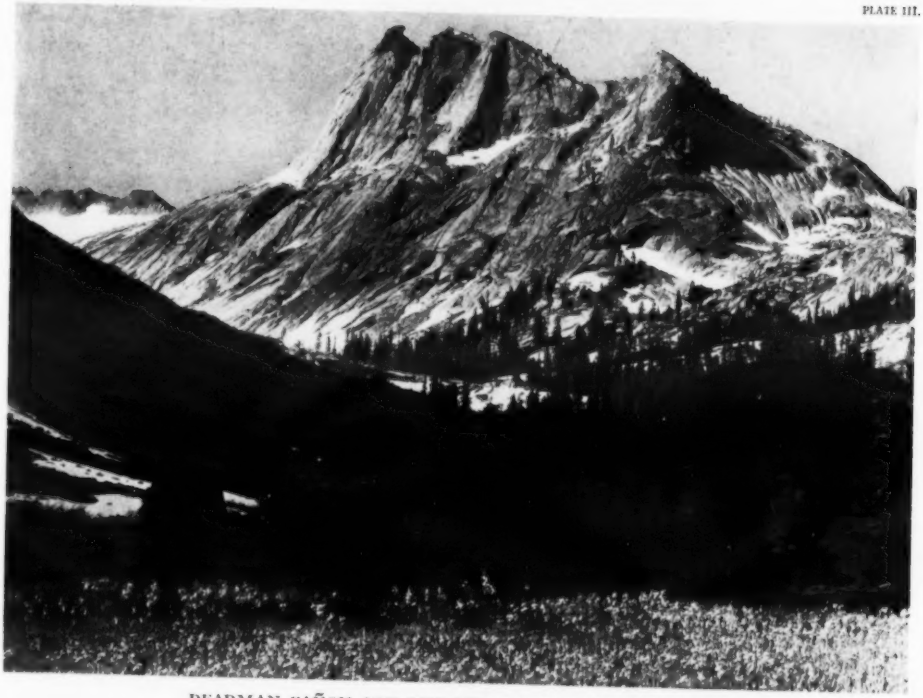
The classic remark that all persons are born into the Sierra Club with a steel spoon in their mouths might be supplemented by observing that their earliest plaything is a bright tin cup bearing the imprint of the clan. These are the pearls of great price to be preserved at all cost, and woe unto him or her who fails to cherish them. They are rather to be chosen than great riches, and the loser thereof may well be forced to revert to barbarism. Nor is that enviable state difficult to attain in this high country, notwithstanding the presence of such notably civilizing implements. Who, for example, would deny that the ripened bandanna, particularly as a food container, has high barbaric content? A better mixer in this democratic group of ours would be hard to find.

In an amphitheater of giant Sequoias our first camp-fire was notable for the presence of Gilbert Grosvenor, President of the National Geographic Society, who had flown from the national capital in order to attend the ceremonies of the morrow. Colonel John R. White, Superintendent of the Sequoia National Park, graciously accorded us proper entrée to his domain, surrounded by his staff of stalwarts, whom our manager, Francis Tappaan, in a burst of eloquence described as "the best damn rangers" in the country. William E. Colby, past master of successful campaigns of the Sierra Club, launched us on our way with final words of wisdom, followed by detailed instructions from our competent manager as to some of the best ways of avoiding trouble and even disaster.

All who remember Stephen T. Mather, the great friend and former director of our national parks, are not likely to forget the impressive exercises on Sunday morning, July 10th, at the unveiling of a bronze tablet to his memory. In one of the finest of all groves of *Sequoia gigantea,* on a simple granite boulder resting peacefully upon the lap



SIERRA CLUB PACK-TRAIN DESCENDING ELIZABETH PASS
Photograph by Ansel E. Adams



DEADMAN CAÑON AND THE RIDGE ABOVE BIG BIRD LAKE

Photograph by Ansel E. Adams

of earth, under the spreading arms of the ancient trees which he strove so mightily to protect and to preserve, the pilgrims of future years may ponder well the noble inscription: "There will never come an end to the good that he has done."

The remainder of our day of respite was spent in quiet enjoyment of delightful surroundings. We were charmed and allured by the lights and shadows of the forest, by the green and flowered meadows interlaced with streams, by the huge and stately trees lifting their massive branches into the luminous depths of blue—the selfsame trees that measure their mighty girth from the days of the Pharaohs, and have weathered the shocks of doom through all succeeding time. Not a few of our number, eager to anticipate the morrow, climbed up the new-cut steps of Moro Rock to gain glorious vistas of the cloud-banked mountain masses of the Great Western Divide.

* * *

Pulling out on a long voyage into unknown seas can have no greater thrill than the spell of the open trail on the first bright morning of a long hike into the mountains. We were fresh and rarin' to go. The park trucks brought us to Crescent Meadow, and there at last we gained the High Sierra Trail, with Lone Pine Meadow for our goal. Fifteen miles and a paltry thousand feet or two for a climb. A bagatelle! At peace with all the world we sallied forth on the well-built trail along the cliffs, filled with that perfect sense of freedom which follows a sharp break from exacting cares and the sure knowledge that there can be no interruption for weeks. As we covered mile after mile, "turning flanks and dodging shoulders," or following the windings of ravines, it seemed impossible that we should ever tire. On our right far across the deep valley of the Kaweah, in a rich mantle of forest, stood the Castle Rocks and other peaks, soft in a haze of blue, while in front and to the east in ever-mounting grandeur rose the stark and gleaming sentinels of the Divide — Sawtooth Peak, Mount Lippincott, Mount Stewart, and many others. In the liquid light the rocky slopes with their deep glacial scourings assumed strange forms. We were constantly entranced by waterfalls leaping in playful fury down the steep ravines, or by the hanging gardens decked with myriad colors. Along the trail in the driest of gravel-banks small intricate flowers sprang from the dust.

Strangely enough we had lost a bit of our freshness when we

reached Buck Cañon at noon, and were quite ready to sit and eat by the edge of the rushing stream. Here we could watch the patient mule-trains swinging into view at the bend of the cliff, then jogging down the last incline into the crystal creek where the thirsty animals would pause for a drink of the cool water. Nor can it be said that all the ladies in their crossing stepped forth with ease and grace upon the slender log athwart the torrent. The gusty breeze played artful pranks with the smoke of our little fire, around which at brief intervals appeared new faces eager to share the hot tea from our billy-cans. And for some this was merely the beginning of one long tea-party which was to last the entire trip.

It was a long dry trail in the early afternoon up through the forest in the dust, with feet and legs beginning to complain. But on reaching open country once again who can forget the strange and novel sight of our many strings of mules, like a hyphenated serpent winding up the rounded cliff, in order to gain the higher level of Lone Pine Meadow? And what a burden were our dunnage-bags and the finding of a dry spot for a camp! And then the sudden chill in the air as the sun's rim dipped behind the long western ridge, and the vain regrets at the icy bath drawn from the fields of snow. Even the heat of a roaring fire in the darkness and a parting word of cheer from Colonel White could scarcely hide our shivering in the frosty air. At last, rolled snugly in our sleeping-bags, under the clear and star-sown vault of heaven, we dreamed away our weariness, nor sensed the brilliant half-moon sinking in the west.

What stiffness of ponchos in the early dawn, what slabs of ice upon the water-pails! What struggle to return to life at the heartless cry, "Everybody up! Get up! Get up!"—at four-thirty in the morning! Of what avail to pity our comrades of the commissary who rose in a darker hour? We were now facing the big test of Elizabeth Pass, over 11,000 feet in altitude and 3000 feet above our starting-point. Once over the ridge and onto the broad upland sweep of the plateau we could view the distant summit of our hopes, a spacious opening with massive rocks piled high on either side. At times, to strengthen our morale, we would pause for a snatch of food or a welcome drink from one of the countless brooks. Then came the final zigzags to the crest and the last thin patches of snow. Breath became shorter, fatigue more intense, while alarming weakness sapped our sinews. In the final lift we were eased along in a powerful surge of air rush-

ing up from the depths below. Victory and refreshment at last! For there in the warm sun, well sheltered from the wind, on a rugged slope of broken granite slabs, sat a host of new-found friends reveling in their cups of snow and apricot jam. Over all the northern slope below, and down into Deadman Cañon at our left, there stretched a mighty snow-field dazzling in the noonday light, and close at hand in startling contrast moved the bronzed athletic form of one of our most enterprising photographers setting up his tripod.

Can you see the screaming parties sliding down the long steep snow-field, some trying to keep their feet, others rolling helplessly, with their belongings scattered far and wide? Is it a horse that wallows in the depths below led by a woman badly in need of a friend? Volunteers descend and with helpful hands finally drag the horse to better footing. The snow is full of pockets of odd shapes with patches of pink here and there which you are told not to eat. Do you remember the sunburn, the greased lips and faces, and how hot you became on the long descent, your feet and legs floundering and staggering in the uneven furrows? Did you look back over the snow to the top of the pass and see the great clouds milling through and enveloping all the peaks and upper snow-fields? Were you chilled by the cold wind and fog pouring down the cañon after the clouds had covered the sun? And what of tea and friendly faces in the shelter of the big boulders below, where you could watch the strings of mules loaded with commissary boxes and heaps of dunnage slumping along on the muddy trail after their eventful struggle on the snow above?

> "Till the snow ran out in flowers, and the flowers turned to aloes,
> And the aloes sprung to thickets and a brimming stream ran by."

It was raw and cold that night in Deadman Cañon amid the endless cadence of many waters, and with flurries of snow sifting down upon our sleeping-bags.

We soon grew used to our new routine of life, and before we knew it a fortnight was slipping by. We left behind the heights of Big Bird Lake, the lush meadows of the lower cañon with its smooth meandering stream, and green fields bright with cyclamen and hosts of yellow flowers. In lower country by the Roaring River we found it dry and warm. We crossed the foaming torrent in the early morning sunlight, we ascended the steep moraine through beautiful open forest, we rested in pleasant vales of purple lupine partly in sun and

shade. Up through the forest with heart-throbs in our ears we mounted shoulder after shoulder, making way from time to time for our commissary huskies tramping by with measured tread, their bare backs blackened with the sun and dust. We came to a broad plateau covered with thrifty foxtail pines, affording noble vistas of sharp peaks to the east, Mount Gardiner and Mount King, and to our right, as we descended the dusty slope, Cross Mountain and the great North Guard.

Those were enchanting nights at Sphinx Creek, with the floodlight of the full moon penetrating the aisles of the forest, the bright stars resting on the treetops, and the rush and gurgle of many streams. It was much too pleasant to sleep, and yet too peaceful not to slumber. Nor will you forget that witching hour of night when the mules sought pasture in the ladies' camp. "What horrid shapes and shrieks and sights unholy!" What hasty exodus from lovely bowers! What tintinnabulation of the bells! Remember also that notable performance of the great tragedy—Exhaustos. The highly versatile author and prologizer, clad in toga and ivy crown, with much vicarious twanging of his rustic lyre, seemed far removed from his more frequent rôle as Lord High Executioner of the "Lost and Found."

In the shades of early dawn we packed for Vidette Meadow, dropping down 2000 feet along the edge of the ravine, and hugging fast to the ingenious zigzags carved in the solid rock. We were awed by the giant spectacle near at hand of stupendous granite walls raising their massive forms across Bubbs Creek and down the deep cañon of the Kings River. Memories of Yosemite hold nothing more superb. We soon passed over the flashing white water of the creek, and after a brief rest about seven in the morning we struck up the cañon with its long gradual rise and intermittent views of the boiling stream. Overhead on our left the smooth majestic cliffs of variegated hues grew more tremendous as we advanced.

In open country up beyond East Creek, peering down into the cavernous depths of the waterfalls below, we were showered by rainbow mists thrown back in the fresh westerly breeze. Then followed open timber and the promise of four restful nights and days under the graceful Kearsarge Pinnacles and the abrupt sharp peak of East Vidette. But woe unto them that are at ease in Zion! This lovely dream was immediately dispelled at our first camp-fire by a call for volunteers to open up the trail to Foresters Pass. The heavy snows of

winter were still blanketing this trail for long stretches, and the whole success of our trip depended on the ability of the pack-train to get over into the valley of the Kern. Building trails and shoveling frozen snow at twelve thousand feet is no idle pastime, but the stalwarts volunteered—and some who were not so stalwart.

It was a long climb the next morning up to the snow-fields, some using the new trail of the Forest Service and others going straight up the slopes to where the work began. As we gazed up to the top of the pass, over 13,000 feet high, the great patches of snow seemed endless. How could any group of thirty hope to open this trail so that the animals in two more days could make the grade? The snow in places was up to our necks or over, and had thawed and frozen for weeks on end. There was nothing to do but build a new trail for a long distance just below the snow, and then cut through the remaining snow by laborious shoveling. At this altitude it was a breath-taking, back-breaking job, dislodging great stones and sliding them down to bolster the lower edge of the trail, or cutting deep into the hard snow to open up the path.

Wearied with our work half done, it was drudgery to descend two thousand feet, but at last we reached our temporary base on a high plateau, with a sweeping grandstand view of Center Basin and the white granite peaks of Stanford and Deerhorn sharply outlined in the twilight of the western sky. High above us, like the Great Wall of China, stood the battlements and bastions leading up to the pass. Here, "under the wide and starry sky," the rising moon still hidden behind the eastern escarpment, we could watch the ever-growing light creep down the western peaks until at last the moon itself stole over the crest, bathing in brilliance all the "mountains of light" and the sleeping silver of the streams below.

The following morning a group of the same volunteers went again to the top of the pass and succeeded in opening what appeared to be a passable trail. Soon the first mule-trains arrived, bearing many days' rations to be cached in the basin of the Kern. They plodded on up the trail, and could eventually be seen standing on the sky-line of the ridge waiting for the snow work to be finished. Reports came later that some of the animals had rolled and floundered in the snow. It looked for a time as if they might not get over. Like Kipling's explorer, they might have retraced their steps—but they didn't, but they didn't; they went down the other side. The day was saved, and

the tired shovelers returned to Vidette to let the sun get in its work on the paths that had been opened; for two days later the main party would advance.

The variety of scene easily reached from Vidette Meadow is bewildering in attractions. If, by chance, you climbed to Bullfrog Lake, you beheld one of the marvels of the Sierra. Here, if ever, was a perfect atmosphere, a veritable garden-spot of the world, where it is always afternoon and the soul of Nature smiles; a crystal gem of blue in a circle of diamond peaks, reflecting cirrus clouds that slowly float on high, a bright retreat where care and sorrow vanish and the shadows flee away.

On our last night at Vidette, the Freshman Show was held; and if a freshman may boast, it was a smart collaboration. It was also the farewell fire for the first two-weeks' party. Friday morning, July 22, the regulars moved up to Center Basin to break the long hike to the promised land of the Kern; and the first two-weekers, casting perchance "one longing, lingering look behind," moved out on foot and horse to Kearsarge Pass and the mild inferno of Owens Valley. It was a cold night in Center Basin for a paper-dress parade.

The long-awaited call for Foresters Pass came in a dim religious light. Our movement was rapid, up past the trail-builders' camp of the Forest Service, up the long frozen windings under the serrated ridge that kept our trail in shadow until we had done our hardest work. Then came the trail of the volunteers and the paths opened through the snow. Such was the heat of the sun in the last two days that a full three feet of snow had gone in many places and the once narrow path had opened wide, insuring safe passage for the mule-trains with the heavy equipment.

Emerging from the snow-fields near the top of the pass, can you see once more the wondrous purple clusters of polemonium springing from barren crevices of rock? Do you recall your sense of conquest without undue fatigue, so different from the long grind to Elizabeth Pass? Slipping in single file through the narrow slot of the pass, with the pyramid of Junction Peak towering far above, we almost gasped at the sheer drop into the yawning gulf below; for there, spread out before us, was the immense plateau of the Kern, the great open spaces, the wide barrens far above tree-line, the frozen lakes—a remote and desolate country given over to winter, a giant fragment of the "vast edges drear and naked shingles of the world."

We found ourselves admiring the engineering feat of the Park Service that had made feasible this link between two great river basins. Long cuts into the solid granite of the precipitous cliffs, with very gradual inclines, enable the hiker to descend some two thousand feet in a short distance, and, although the riders of horses might feel strange qualms as they balanced on the edge, they too need have no fear. On reaching the snow-fields below we were soon wallowing in the slush of the trail leading down to Tyndall Creek. The friendly foxtail pines once more came into view and the creek widened and the rush of water increased. The purple of the distant cañon became invitingly romantic, and we soon had glimpses of the many high peaks of the range—Mount Tyndall, Mount Williamson, Mount Whitney—all the great peaks of the Kern. We finally reached our camp-site by Tyndall Creek, where the glacier in former times had disgorged such a plentiful harvest of boulders that it was almost impossible to find any rock-free space for a bed.

Early on the morrow we partly retraced our steps, going back up Tyndall Creek, then over barren ridges and down into Milestone Basin. Scattered far and wide in the rough gravel and boulders, the dead but strangely vital foxtail pines, stripped of all bark, their huge ocher trunks and contorted branches reaching up into the deep purple sky, proclaimed their ceaseless battle with the elements. Like specters they stood in proud isolation, mute sentinels to the fell clutch of circumstance. While some of our group struggled up the rocky heights of Tyndall and Williamson, most of us sauntered down to Milestone Creek and picked out restful quarters for the next three nights. What splendid slabs of ledges, what brooks rushing between, what crystal cascades casting their far-flung waters into the upper reaches of the Kern, and back of it all, high up in the western sky, a mass of broken peaks with the monument of Milestone in their midst!

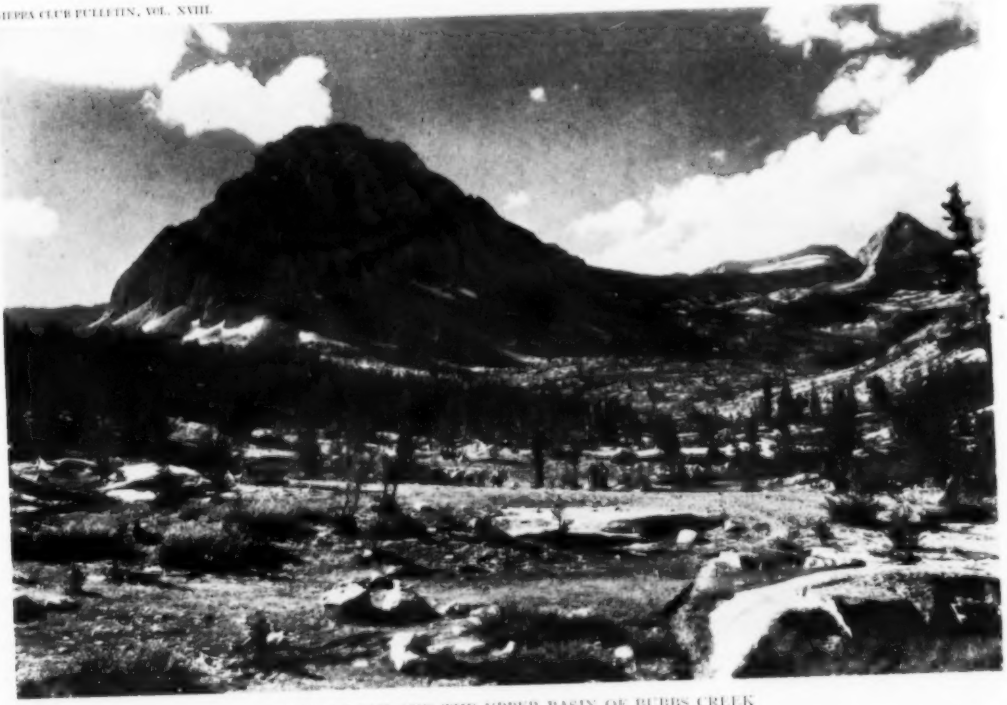
Few places in the whole Sierra Nevada can have superior charm to this great basin, with its numerous lakes, its rugged cliffs, its many easy climbs, and its tough old mountains — Milestone, Thunder Mountain, Table Mountain. Here were alpine lakes and streams teeming with fish for the ambitious angler, sheltered lakes for swimming, colder lakes for heroic divers, and gushing streams filled with snowy waters. From the heights above the basin what inspiring views could be had of the whole contour of the Whitney range—

Mount Russell, Mount Langley, and others! What ethereal lights and shadows ever-changing, what infinite variety of puffy clouds sailing over the far scene, what terrifying drops to the lakes below shimmering in the sun and breeze! And deer were near at hand if one strolled quietly and alone in the forest.

At Milestone Creek the second two-weeks' party joined us on Monday, July 25th. A score or so came in from Independence, stopping the first night at Onion Valley and the second at Center Basin at the camp-site we had left. On the third day, after the toils of Foresters Pass and without our two-weeks' preparation, they also entered into the kingdom. Here at Milestone we knew the luxury of longer slumber, and once postponed our breakfast even until eight o'clock. Our stay ended with the packers' entertainment—the plaintive guitar, the rope-spinning, the mournful songs and touches of color, the chill in the air, and the big camp-fire.

Crossing over to Tyndall Creek once more we pressed on to our big objective—Mount Whitney. It was a long, steady climb to the broad expanse of the Bighorn Plateau, with the whole panorama of the Western Divide and the Kaweah Peaks in full view on our right; one of the sublime waste places of the world, a land where earth and sky seemed intimately close, and all the works of nature loomed on a vast and mighty scale. Plunging down to Wallace Creek through a graveyard of rocks and trees, and climbing once again up the side of a long ridge, we came to delicate purple carpets of dwarf lupine under the scattered trees as far as we could see, and occasionally a broad meadow, full of yellow flowers, sloping to the west. We had thrilling glimpses to the east of the great mass of Whitney and the other giants with their jagged peaks, then dropped to treadmill sands that seemed to have no end. At last we reached the open timber of Crabtree Meadow, to find a bubbling spring and tea and cheerful faces and the pack-train dusting along and dumping our dunnage once more so that we might not be idle. By sunset the many clouds departed that had proved an all-day blessing, and the white granite steeps of Whitney, broken with many chimneys, invited us to climb. They were so inviting that many of our jaded group who craved a new sensation insisted on a midnight party with a sunrise goal. The story of this raid upon the mountain fastnesses, 'twixt flashlight and starlight, cannot here be told, but there were rumors of some faltering in the darkness before the good horse-trail

CENTER PEAK AND THE UPPER BASIN OF BUBBS CREEK
Photograph by Walter L. Huber



CENTER PEAK AND THE UPPER BASIN OF BUBBS CREEK
Photograph by Walter L. Huber

JUNCTION PEAK FROM THE NORTHERLY APPROACH TO FORESTERS PASS
Photograph by Ansel E. Adams

was gained. Those aspirants who viewed the orient pearls of sunrise through the V-shaped apertures of the crest record a sublime experience, but they seemed a trifle tired in the late afternoon.

The more orthodox mountaineers were quite content to delay their start until the bluish dawn. Gaining the high lawns above, we chose a promising chimney for our climb. In the long upward struggle we would often halt that we might better view the magnificent spectacle below, the great gulf with its giant cirque and huge Gothic buttresses supporting mighty walls of rock, the glassy surfaces of ovoid lakes, still black in the heavy shadows. On the last long slope to the summit big clouds high overhead shut off the blinding glare. We suffered strange weakness in our legs and shortness of breath and not a little faintness and hunger, but eventually we all arrived (a hundredfold) on the very pinnacle of the United States — 14,496 feet above the sea. As we approached the topmost rocks, two roaring airplanes swooped out of an empty sky and zoomed in giant circles near at hand. And filling the atmosphere as far as the eye could reach were endless waves of purple lights and shades and streamers from the sun, forever changing and forever new, suffusing with radiant hues the whole vast scene of mountains and their countless patches of snow. To the west across the valley were the somber reds and browns of the Kaweah Peaks, and to the east the awful and stupendous void opening down, down, down to the Owens Valley 11,000 feet below; and beyond, the shifting, wavering colors of all the desert mountains, and the distant Panamint Range walling Death Valley.

Four o'clock risings were so habitual by now that the tinkling mule-bells in Crabtree Meadow became soft music to our ears. With loud cries and galloping, the packers rounded up the protesting animals, and before sunrise in the dewy air we were winding down the creek, a route unmarked by any trail. The gorge descent of Whitney Creek two thousand feet into the cañon of the Kern, down an endless chain of cascades and waterfalls, through heavy shrubbery and over great logs felled across the stream, with dancing sunbeams sparkling in the spray, was a rare and delightful experience. Few are the natural scenes that are improved by human touch; but if an artist ever builds a trail down Whitney Creek and removes the choking shrubbery and foliage, he will fully reveal one of the incomparable gems of the Sierra.

JUNCTION PEAK FROM THE NORTHERLY APPROACH TO FORESTERS PASS
Photograph by Ansel F. Adams

We were at last in the deep cañon of the Kern, its towering walls rising from two to three thousand feet on either side, unspoiled by the hand of man, and beside us at all times the ceaseless rush of the widening river over the rounded stones. As we proceeded down the cañon on our long march, the strong wind blew hot in our faces and the noonday heat became intense. Eventually we came to Upper Funston Meadow, where the high Chagoopa Falls come clear from out the sky. Here we made our camp, and here on the hot dry ground under the tall pines there were rattlesnakes to kill, but hardly enough for a stew. It was a warm night at the camp-fire, for we had dropped well below seven thousand feet. In a wakeful moment of the night perchance you heard strange rustlings near at hand and sought deeper refuge in your sleeping-bag.

* * *

We were now entering the last phase of our trip leading back to the Giant Forest. Our zest for life had enormously increased. New courage and hope had revived and restored our once faltering souls. We had suffered a rebirth and an awakening. Our annoying infirmities of the first few days had been slowly transformed into a new and boundless energy. We felt the "thews of Anakim, the pulses of a Titan's heart." Uncloyed by all our past delights, we still hungered and thirsted for fresh charms of infinite variety hallowed in the sunshine and the beauty of our world. We were insatiable.

Let it be said, however, that moments come even on such an outing when all is not heroic and life seems drab and uninspiring. Our dawns were never gray, but they were often raw and cold. You may recall a particular morning when you felt a bit depressed with everything. In the fading starlight you had been rudely aroused by a boisterous call. You had crawled into damp and dirty clothes once more. With cracked and swollen fingers you had struggled with your mule-scented dunnage-bag, swinging it at last to your shoulder. Cold and faint with hunger and stumbling down through dust and boulders, or across the slippery log that spanned a treacherous stream, you finally hung your heavy burden on the weighing-scales. Yesterday it passed, but today it was overweight. Defeated and chagrined you retreated from the line, reopening the bag to withdraw some hoary article for consignment to your knapsack. Delayed by this unfortunate maneuver, you had to play the waiting game in the long

breakfast-line, where you could not choose but note the dirty and unshaven men and not a few disheveled women. And you reached the bacon platter just too late to rescue the last six pieces from a lean and hungry packer who had sneaked behind the line. But the next hour all had changed. You were on the trail again. The sun was up. The lark was on the wing. And so it was through all the days and nights. In times of momentary trial you would almost weary of it all; and then would come some new and startling scene or happy human contact to give you fresh vitality.

And let a neophyte and an Easterner pay tribute here to the efficient planning of the whole trip, the almost perfect functioning of the organization, the unsparing devotion of the commissary (Tachets and attachés), the able handling of the pack-train, and the cheerfulness and friendliness that surrounded all our activities, and the ever-watchful care that no lost sheep should stray from the fold. If now and then we missed the splendor of an Eastern sunset and the freshness of earth after rain, we were more than compensated by the continuously dependable weather for camping, unknown in most parts of the world. The variety of entertainment — musical, histrionic, scientific, historical, or managerial—furnished at our wilderness camp-fires, was sometimes amazing, and honorable mention should here be made of the contributions of Ansel and Virginia Adams, Ernest Dawson, the two Dots—Leavitt and Baird, Francis Farquhar, Ernest Arnold, Ed Rainey, Francis Tappaan, and many others.

Nor would any account of our outing be at all complete without some reference to the ascents of various peaks by our nimble mountaineers led by Norman Clyde, Bill Horsfall, Glen Dawson, Jules Eichorn, Ralph Chase, Lewis and Nathan Clark, Bob Lipman, and others. One or more parties of enthusiasts reached the summits of the following peaks, in some cases by routes never before attempted: Brewer and Cross Mountain (from Sphinx Creek), Kearsarge Pinnacles and East Vidette, University Peak, Junction Peak, Tyndall and Williamson, The Milestone, Table and Thunder Mountains, Barnard, Russell, Whitney, Muir, Kaweah Peak, the Red Kaweah and the Black Kaweah.

* * *

And so we gained the heights of the broad Chagoopa Plateau, leaving behind the deep blues and purples of the symmetrical cañon of

the Kern. Emerging from the forest, we suddenly burst onto the miracle of Skyparlor Meadow, with its bright consummate flowers, and passed on to the clear waters of Moraine Lake, finding a perfect camp-site under the pines along the shore. It was a stunning view at sunset from the ridge above the Big Arroyo, and behind us the high eastern crest of the Sierra, a strange green in the alpenglow. There were German folksongs at the camp-fire.

How the ladies enjoyed their early morning swim and "eas'd the putting off these troublesome disguises which we wear," and how the welkin rang at nightfall with the entertainment of the younger set and the smart costume party! There were dancers in the dust, and Solomon in all his glory was not arrayed like any of these. What pipes and timbrels, what wild ecstasy!

Passing down through the Big Arroyo, the main party ascended to Little Five Lakes Basin for a three-nights' stay, while three small groups advanced along the ridge to meet the challenge of the Black Kaweah. Do you recall our last evening by the lakes and the novel sight of falling raindrops, with campers scurrying to cover? In three minutes it was over and we settled down to the enthralling presentation of the Trudgin' Women, far indeed from the ringing plains of windy Troy. And don't forget the display of paintings, bandannas, wild flowers, hot-water bottles, and other effete paraphernalia, in the late afternoon.

Comes another call under the fading stars and we are off to Kaweah Gap. We cross the Big Arroyo in the dark shadow of the Kaweah Peaks, we ascend the slopes of dewy lawns sprinkled with blue and yellow flowers, we wander up through saturated meadows and overflowing streams, we strike hordes of ravenous mosquitoes that spur us up the zigzags to the opening in the divide. And these were the only mosquitoes on the entire trip that really bothered us. On the downward march we come to wintry scenes where snow lies heavy on the trail, and the black glassy depths of partly frozen lakes reflect the giant precipices above. We assemble in full array at the trail-builders' camp, to be guided down over the steep bluffs to Hamilton Lake, 2000 feet below. The tough bushes between the rocks gave excellent handholds, but it was slow work for the entire party to reach the lake, for every step had to be carefully watched and no stones must be dislodged on the parties below.

In our drop to River Valley in the hot afternoon we had more

scenery of great magnificence. On our right the colossal granite walls towered perpendicular and forbidding under heavy thunderheads; but as usual the threatened deluge failed to materialize, except perhaps upon the mountaintops. We passed down a long series of splendid waterfalls and over bench after bench of granite cliffs. Then came deciduous trees and dry leaves and powdery dust at the 5000-foot level, but the rushing stream was there again to purify. Here in a heavy forest growth we made our last camp-fire, graced by the presence of Horace Albright, Director of National Parks, Colonel White and his rangers, and other friends, who spread before us fresh fruits sweet to the taste. The important thought was expressed that all who are interested in Sierra trails should be forever watchful to spread the gospel of their use.

Sweet was the breath of morn for our last hike in the mountains and sad the thought of parting; but with fifteen miles to go we found it easy to suspend regrets. The climb up over the dusty ridge through heavy pines and firs became exacting work, but we were down again at last by the waters of Buck Cañon and from there retraced our first day's march on the High Sierra Trail. What then was short and easy now seemed to have no end. Would we never gain that final turn that leads to Crescent Meadow? But all along the way we reveled in the freshness of the air and the marvelous distant blues of the lower altitudes across the valley of the Kaweah. Finally, in the shadow of the giant trees we reached the Eden of our goal and the manna sent from heaven. Oh, the red and luscious watermelon! . . . Must we thus "leave thee, Paradise, . . . these pleasant walks and shades?"

AFTER FORTY YEARS

By Theodore Seixas Solomons

TO those members of the Sierra Club who were young when the club was young, this must sound like a voice from the dead.

In 1892, the club's birthyear, the writer threaded the almost unknown head-streams of the main San Joaquin, and during several succeeding summers explored the larger part of the upper basin of that river. Some account of this appeared in the pages of the Bulletin in the middle nineties, and there remained fewer white spaces on our old Le Conte maps.* Then—evanishment!

I had gone exploring in Alaska, remaining there ten years. When I returned to California I built a forest home near Yosemite, lest "auld acquaintance be forgot." Yet never again until last summer did I set foot in the High Sierra. The nearest approach was an occasional drive over the old Tioga Road.

But I had kept in touch. Something like my living wraith had accompanied the young men and women who, year after year, followed Colby and the rest; and my mind's eye had traced the progress of an actual Muir Trail, just as, in my youth, a preconception of it had spurred my searching feet.

No, it was not a lost, nor even a waned, interest or affection that kept me away. It was—many things! When, however, opportunity tempted, last June, I found that of these deterrents only one remained. This, the least legitimate, encircled me accusingly, like a fleshly handcuff. In altitude a scant five feet five, my weight was two hundred and three pounds; and being well started on the road to seventy, age if not girth pronounced this a down-hill road into the valley of shadows, not an up-hill trail into the mountains of light.

There was nothing for it but to preface my trip by a week or two's training at "Flying Spur," my forest home, which should now become a spur to climbing. The maker of my belt had punched in it five holes, of which the four farthest from the end had remained purely ornamental. Now, one after another, they were to be pressed into

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* These articles are listed on page 117 of "Place Names of the High Sierra," by Francis P. Farquhar, Sierra Club, 1926.

service, or *vice versa.* During a preliminary try-out in the Yosemite High Sierra the fourth hole was reached in this golf-like exercise in which a buckle tongue was the ball and the goals it won were many miles apart. And when my younger companion and I started from Mammoth Lakes as full-fledged high-trippers a boy-scout knife had bored the first of several extra holes in a belt that had begun its second lap around the course.

Sierra-ites, including one who should know—the chief ranger of the Sierra National Forest—assured me that I should find the old peaks little changed. They were seers! But I did not think so at first, for the mountains seemed shrunk—by insensible comparison, it may be, with the immense high landscapes of Alaska. Nor did I believe them a little later when, toiling to surmount the ridge between Mono Creek and Bear Creek, the whole Sierra seemed to have assumed Himalayan proportions.

That long slope—a lateral divide uniquely unwall-like for one so near the crest—I remembered well from an incident of thirty-eight years before. A loaded jack, losing his balance, had turned half a dozen back somersaults down it without hurting anything but his feelings. The ridge then had resembled a very large railroad embankment. Now, in the scaling, it was stupendous. Yet that morning, from the North Fork of Mono Creek, it had looked disappointingly low and commonplace. Make what you can of this double paradox!

Not the Sierra, but I, had changed, and in ways deeper than girth and agility. So, doubtless, Colby, Le Conte, and others have changed greatly in their reactive impressions during an adult lifetime of summers in the Sierra, but insensibly; while with me the new impingements, after a lifetime of separation from the old, produced an impression of inner change that was always vivid and sometimes vital.

The effect of mirage-like overtones in the distant views had departed. Possessing but little more technical knowledge than then, I now knew the rock, near or far, as earth rock, not heaven's, not sublimated. But if glamour had gone, beauty had stayed, had matured, had enlarged her sovereignty, imprinting herself even on the bare, ashen gray of the treeless basins, the peakless slopes. Of these landscapes the youthful impression had been that of "awful desolation." Now they were merely austere, with beauty implicit in their dignity.

I think the sense that was at once the most constant and the least expected was that of familiarity. This terrain I knew, from valley

to ridge-top, whether or not each part, or any, was actually recognized. It was mine. Every dry gravel-flood, every miry rivulet-crossing of the hillside aspen brake, every shy plot, every stick and stone, had been waiting for me—just as they all have been waiting a year, a hundred, for all of us.

If that which, for me, had supplanted the vanished glamours of the Sierra—if "beauty is in the eye of the beholder," the eye is, in turn, in the mind, and the mind in the experience of the beholder. All things seen and known, all things enjoyed and suffered, had turned to loveliness and waited for me in the mountains of my youth.

As for the trip itself, and my less personal impressions—these were various. It gave me an uneasy feeling to learn of a railway under Kaiser Crest, an automobile road at the lower end of Vermilion Valley, and a golf-course in the Second Recess of Mono Creek. My old names had stuck, but their romantic remoteness was no more. There may be some day a cogged railway up the roof of that unique stone edifice, Seven Gables; but I, for one, would never protest. All the "culture" it could ever be profitable to impose on the High Sierra would be a few mere threads of road or rail, an occasional scallop of dam, like that at Florence Lake, a few draggled meadow camps that time will quickly renovate. In detriment, even visual, these things will amount to less than a tenth of one per cent in the nearer prospects and to nothing at all in the larger expanse; while for benefit they will carry the very banner of purpose of the Sierra Club—"rendering accessible" to countless thousands, and enabling them "to explore and enjoy" the chief "mountain region of the Pacific Coast."

I found myself frequently challenging the Muir Trail when it began an ascent or descent, but almost invariably agreeing with it before it reached the top—or bottom. It zigs and it zags, but what a boon for the pack-animal whose heavy load secures those chief *desiderata*—more comfortable travel and the longer sojourn!

Thanks to the trail and some side issues I remembered, we reexplored the entire San Joaquin basin pretty thoroughly in the five weeks of our outing, and were wet only once, when snow and hail drove us netherward from Evolution Lake after a ramble over the Goddard Divide from Muir Pass and the investigation of what I took to be a "new" glacier. I wanted to get into the Enchanted Gorge, between Scylla and Charybdis (there's that glamour again), but we didn't — between our jacks walking out on us and one thing and

SIERRA CLUB PACK-TRAIN DESCENDING THE SOUTH SIDE
OF FORESTERS PASS
Photograph by Walter L. Huber

Pass

Trail

FORESTERS PASS, A NEW FEATURE OF THE JOHN MUIR TRAIL.
Looking North from the Plateau of the Kern
Photograph by Ansel E. Adams

another. From the little I can learn, the place seems to have been neglected, though it is eminently worth the camera of a Huber or an Adams. Or did I dream it all, nearly forty years ago?

I was pretty fit by the time I bored the third new hole in my belt. Fatigue came seldom. I could no longer run down a talus-slope or spring unerringly from fragment to fragment in the descent of a peak. But I climbed nearly as well as ever, though more slowly. And with a satisfying degree of endurance. Crackling yellowed paper recording ascents made *years after* my own gave my blood a queer anachronistic tingle.

When I reached home I stepped blithely on a scales and found I had lost thirty-five pounds. Mislaid, rather. Quite a few of them have turned up since.

I have but two suggestions for the young and girthless. In their zeal for the big things, let them not forget the small. Size is only a relation — and the least significant, often the least valuable. The great peaks, the great rocks, the great trees, are few; the lesser, myriad; and myriad are the carices, shrubs, and insects. More revealing, more enthralling often, are these miniature books in the running brooks, these sermons in the smallest stones—these microcosms in the great Sierran macrocosm.

The other suggestion is, it's a good thing — I speak from experience—to go into the High Sierra at least every forty years. Get the habit!

FORESTERS PASS, A NEW FEATURE OF THE JOHN MUIR TRAIL
Looking North from the Plateau of the Kern
Photograph by Ansel E. Adams

PRIMITIVE AREAS IN THE NATIONAL FORESTS OF CALIFORNIA

By S. B. Show

REGIONAL FORESTER, CALIFORNIA REGION, UNITED STATES FOREST SERVICE

THE outdoor California of a short twenty years ago was still largely primitive in the sense that one turning to it for his recreation had to depend on a saddle-horse or his own legs for transportation, on a pack-mule or his own back for service of supply, and on the sky or a tent for shelter. The great surge of road-building in the California mountains, following naturally from the large-scale production of low-priced autos and the corresponding invasions by organized and formalized recreational facilities — resorts, stores, gas-stations, auto-camps—has altered the situation. There has been a steady and rapid pinching in of areas where those who wished might enjoy the freedom and thrills and comparative solitude and informality which were the characteristic of mountain recreation in the horse days.

Most of us who knew the distinctive qualities of the former days regret the apparently universal trend toward carrying the qualities of de-luxe accommodations and the sophisticated pleasures of urban life into outdoor recreation. At the same time, one has to recognize that roads and resorts have opened to many people opportunities which they had not previously enjoyed, and that, on the whole, there are unquestioned gains, and large ones, in social health and fulness of life.

But it is equally clear that along with the gains that followed from the wholesale invading and civilizing of the California mountains there is a loss that, for a time, threatened to become irreparable. Most simply expressed, I think that may be defined as loss of opportunity for the individual to prove himself man enough to earn his outdoor pleasures and thrills by his own effort. The older generation of mountain travelers know that personal contest with Nature and conquest of her difficulties—no matter how stern or kind she might be—was typical of the self-reliance, durability, and hardihood of the genuine pioneer in California and elsewhere. The conquest of a

mountain by riding up it in an auto in high gear might yield high esthetic enjoyment, but it can scarcely increase one's self-reliance or self-respect. But conquest of the same mountain on foot from one's own camp inevitably added something, elusive perhaps to define, that was of major value to the individual and to society.

I suppose most thinking people must feel that the softening processes of civilization, due to growing wealth and easier living conditions, are a real threat to the dwindling outdoor areas where the qualities of the pioneer can be used. Mere contemplation of Nature's beauty is not the typifying quality of the pioneer. Conquest of her—beating her at her own game by his own efforts—is rather the quality that counted.

Now, a very large part of the mountain area in California which possesses the charms and grandeur and the opportunities for enjoyment is in the national forests. And to the surge of road-building and development of resorts, the Forest Service contributed its full share. The vast majority of the roads built by the Service have been inevitable in order to better redeem our responsibility for controlling fire. As Sierra Club members know, fires in the California mountains spread rapidly—they destroy the vegetation which gives our mountains much of their appeal. To control fast-spreading fires, fast attack is necessary, and that means roads, and lots of them. Also, most of the resorts permitted by the Service on national-forest land are essential to serve the rising tide of recreational visitors, a tide which the Forest Service did not start and would not stop even if it could.

Several years ago it was clearly time for the Forest Service to ask itself the questions: "Where is this going to end? Can some areas be deliberately kept in primitive condition? How shall this be done before it is too late?" Under the leadership of Colonel W. B. Greeley, then Chief of the Forest Service, and himself a Californian, and L. F. Kneipp, then and now in charge of the lands work of the Service, a comprehensive study of these questions was started in 1927. L. A. Barrett, Chief of lands work in the California region, headed the project, with active help from the eighteen forest supervisors.

The upshot of this undertaking was that today eighteen primitive areas have been designated and set aside under definite plans of management which are designed to guarantee the preservation of existing conditions substantially unchanged. These areas contain a

total of 1,927,144 acres, of which 1,859,782 are in national-forest status, and but 67,362 in private ownership. In round numbers, about ten per cent of the total national-forest area in California is to be managed as primitive area.

In making the studies leading to this program a number of difficult questions of policy had to be settled. I think the Sierra Club members may be interested in these considerations. First of all, the basic laws under which the Forest Service operates contemplate commercial use of timber on national-forest land. Such use means logging operations, which not only alter to a degree the essential native character of a country, but necessarily mean roads and structures. It seemed impossible and unwise, therefore, to attempt selection of primitive areas where the country was predominantly timberland which it could be foreseen would some day be logged. But many areas in the national forests have patchy or irregular forests interspersed with barren ridges, glades, and meadows, and in this type of country we did select primitive areas. Plans of management under such conditions generally contemplate that a minor amount of timber will be eventually used on or near the area itself, but without modifying the essential primitive nature of the area.

A further consideration which proved bothersome was the known necessity for fire-protection roads in most of the timber country which now lacks them. Essentially this need is dictated by the character of the fire problem and the rate of spread of fires, and not by a predilection for roads on the part of the Service. Quite obviously, roads are in conflict with the very nature of primitive areas, just as are large-scale lumbering operations. So, where fire studies had shown roads to be truly essential, it was necessary to give up the idea of primitive areas.

Yet another major factor had to control and limit our choice—the existence of privately owned land. It is an unfortunate fact that in many of the most enjoyable mountain areas the key tracts of land had passed into private ownership before the creation of the national forests. Land bordering the mountain lakes, little flats along the streams, and similar areas which control the use of large areas of mountain land, have to a large extent ceased to be public property. Experience shows clearly that most private owners seek to obtain income from these key holdings by selling or renting to individuals and to those who wish to build and establish permanent summer

homes, resorts, or clubhouses. Although I do not see how these private owners can be fairly blamed for doing this, yet it is a fact which we had to take into account, that such buildings on private land could destroy the whole essential primitive character of large areas. So, where a large part of the key tracts were patented, we usually had to give up the idea of setting aside primitive areas.

Fortunately, we did not find any areas which have been rendered unsuitable because of activities under Forest Service permit. Many have some grazing use; some of these will be continued. But as the need for feed for pack- and saddle-animals increases, domestic livestock use will have to decrease.

In emphasizing the difficulties we encountered in selecting a comprehensive group of primitive areas, I am merely indicating why it was impracticable to go further than we did. All the way through we wanted to avoid the absurd futility of making a paper designation of an area when the known facts made it a certainty that a logging operation, or roads, or developments on private lands, would in time render the primitive-area plan of management null and void. Essentially, we regard the program as a promise to ourselves and to the public to maintain primitive conditions on the areas selected." And to do that will certainly be difficult enough, for already a wide variety of proposals have been made as to specific areas, which if accepted by the Service would mean the breakdown of the whole plan. For example, many individuals and groups have thought it would be a fine thing to have summer homes in the primitive areas. We will gladly take care of them elsewhere in the national forests, but not in the primitive areas. Others have wished to establish pack bases, but here again we have felt that this was contrary to the spirit of the undertaking.

One of the more recent proposals is to develop airplane landing-fields in some of the primitive areas so that people can reach them without too much trouble and delay. Clearly, this, too, is a contradiction in terms. And, of course, numerous proposals, some of them with rather impressive sponsorship, have been made to allow just one road into a primitive area so that it might more easily be enjoyed by more people. Again, this proposal is antagonistic to the very definition of the basic purpose. Roads do and will come to, or near to, the boundaries of some of the areas; but in the main, that is all. On two or three of the areas, a very limited mileage of strictly pro-

tection roads, closed to public use, may prove essential for effectual fire control. Of course, many of these and other proposals have been made because the primitive-area program is so new and the concept of its purpose and of what can and cannot be done is not yet understood by most of the people interested in the California mountains.

As to the pressure for relaxing standards of administration and breaking down the plans of management already adopted, I have no personal doubt that the Forest Service will be able to stick to the program it has set up. We are taking the program seriously and have sufficient administrative authority to carry it out.

There is, most unfortunately, one major threat against the integrity of the whole undertaking, and it is beyond the control of the Forest Service. That is, the existing mineral law of the United States administered by the Department of the Interior. Under the law, mineral locations may be made on any national-forest land and held for the exclusive use of the locator, without attempt to patent so long as certain prescribed assessment work is done. Until the claim is pressed for final patent, the locator does not have to prove the existence of mineral. Even when patent is asked, the mere existence of mineral is usually held to prove the mineral character of the land and to justify patent. Because of decisions over a long period of years, such substances as cobblestones, flagstones, chicken-grit, gravel, and rock suitable for crushing have been held to be mineral. Once patented, a claim may be used for any purpose, usually recreational, and the public is without redress.

Despite a constant struggle by the Forest Service, the national forests are thus losing many highly important key tracts of inestimable value for public recreation. So long as the antiquated mineral laws remain unchanged and unscrupulous individuals are willing to use them, the Sierra Club should recognize that the primitive areas are not permanently safe against private exploitation contrary to the public interest.

The Forest Service has never contested a claim which our own expert examination showed to have real mineral in commercial amounts or susceptible of commercial development. The responsible representatives of the true mining industry in California recognize the serious evils that have grown up under a set of laws which says in effect that mineral of any kind and in any amount automatically and invariably becomes the most important value on any public land,

and justifies the United States in passing the land to private ownership. Several pieces of suggested legislation have been prepared, any one of which would relieve the existing losses of public property and the threat of greater future losses. But, except for withdrawal of certain lands from mineral entry in the Angeles National Forest, none of these acts have become law.

I have made no attempt to describe the various primitive areas. The club members are interested in seeing and enjoying outdoor California under their own power rather than in reading about it. The largest of the primitive areas, the High Sierra, of 761,790 acres, all but forty acres of which is national-forest land, is in the Inyo, Sierra, and Sequoia national forests. It includes territory which the club has made its own, and which has been often described in the SIERRA CLUB BULLETIN.

The Marble Mountain Primitive Area on the Klamath National Forest and the Salmon-Trinity Alps Primitive Area on the Shasta, Klamath, and Trinity national forests do deserve a word. The first contains 237,527 acres, all but one per cent of which is national-forest land. It is a superb piece of mountain country, lacking perhaps the magnificent proportions and grandeur of the High Sierra, but with some first-rate features of its own. By all odds, it is the least-known and least-used mountain area of California, and to me the very differences between it and the better-known High Sierra are a source of keen enjoyment.

The Salmon-Trinity Alps Primitive Area of 196,420 acres, 167,660 of which are national-forest land, has as its culminating point Thompson Peak, the highest point in the Coast Ranges. Some of the high rugged mountains in this area are not greatly inferior to parts of the High Sierra, though their absolute elevation of course is less. This area, too, has distinctive qualities and interests of its own, and is little known.

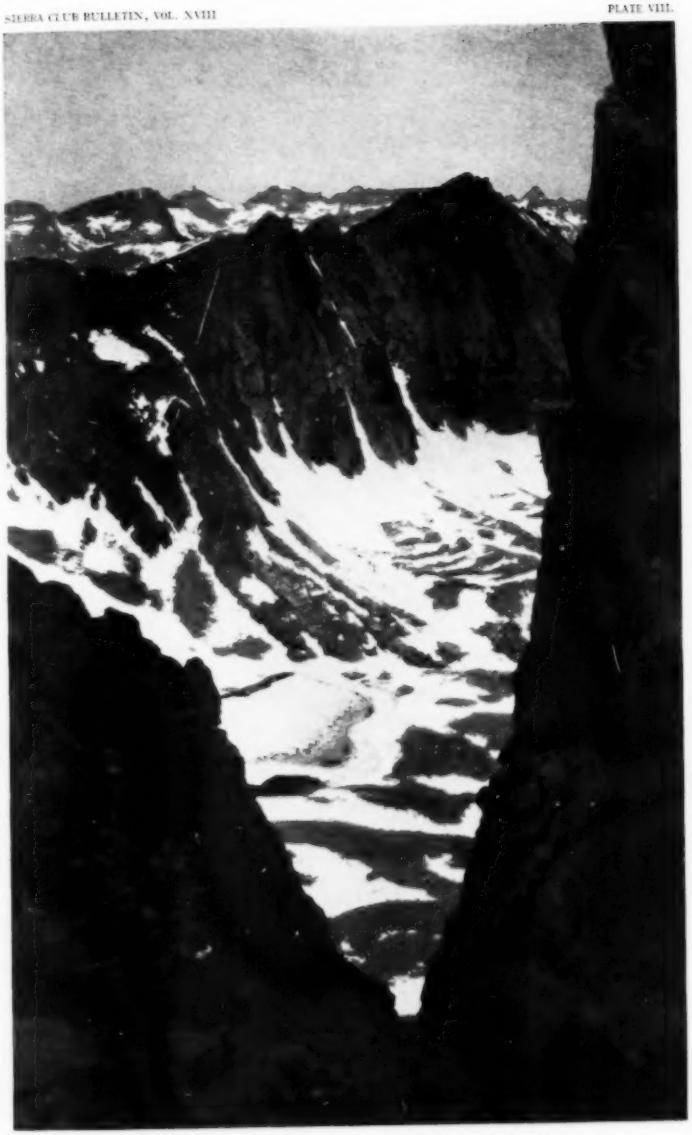
The other primitive areas within the national forests of the state are smaller in size, and many of them perhaps have their major value to people living close at hand, who can enjoy them with a minimum amount of travel and at minimum expense. Most of them might not interest those who seek the supreme in quality or who are able to make long trips into large areas of wilderness country. But the Forest Service has felt it was part of the job to perpetuate opportunities for shorter trips close at home to the greatest possible num-

ber of pioneer-spirited folk." After all, the value which the primitive area offers to the individual does not depend primarily on his seeing the highest mountain or the deepest cañon or the biggest tree. The value depends rather on obtaining through his own physical and mental ability some sense of conquest or some other enjoyment which is denied his fellows who are unwilling to make a personal effort.

The following list shows the general location of all the areas and indicates the wide distribution it was fortunately possible to attain. Whether or not the number, size, and distribution of the individual areas, and the area involved in the entire system, represent what is ideally desirable to perpetuate primitive conditions is no doubt open to argument." But under limitations in selection dictated by laws governing the basic purposes of national forests, by inherent nature of the fire problem and the necessity for roads as a fire-control measure and by past mistakes in allowing key lands to pass to private ownership, one is justified in saying that the primitive-area system on the California national forests represents at least a fair provision for the present and future. It is at least a going concern, subject to only one major threat which the Forest Service cannot handle—that of unrestricted operation of archaic mineral laws."

I hope the club members will gradually become acquainted with these areas, particularly the fine ones of northwestern California.

NATIONAL FORESTS	NAMES OF AREAS	ACREAGE		ROADS	TRAILS
		PUBLIC	PRIVATE		
California, Region 5:					
Angeles	Devil Cañon-Bear Cañon	36,200	.....	Limited	Contemplated
Cleveland	Agua Tibia	26,225	645	Motorways	Contemplated
Eldorado	Desolation Valley	40,700	680	None	If needed
Inyo, Sierra, Sequoia	High Sierra	761,750	40	None	When needed
Klamath, Shasta, Trinity	Salmon-Trinity Alps	167,660	28,760	None	Minimum
Klamath	Marble Mountain	234,957	2,570	No public	Contemplated
Lassen	Caribou Peak	16,403	40	None	Contemplated
Lassen	Thousand Lake Valley	15,495	840	None	Contemplated
Mendocino-Trinity	Middle Eel-Yolla Bolla	136,106	7,280	None	If needed
Modoc	South Warner	68,242	2,440	None	Contemplated
Mono	Hoover	30,540	.....	None	When needed
Mono and Sierra	Mt. Dana-Minarets	62,181	195	None	No additions
San Bernardino	Cucamonga	5,000	.....	None	No change
San Bernardino	San Gorgonio	14,000	6,000	None	Contemplated
San Bernardino	San Jacinto	20,343	13,290	None	Contemplated
Santa Barbara	San Rafael	74,160	830	Protection	Contemplated
Santa Barbara	Ventana	42,800	2,720	None	Contemplated
Stanislaus	Emigrant Basin	97,020	1,023	None	Numerous



MOUNT TYNDALL FROM MOUNT WILLIAMSON
Milestone, Table, and Thunder Mountains in Distance
Photograph by Lee S. Stopple

MILESTONE MOUNTAIN
Photograph by Walter L. Huber

THE PROBLEM OF THE LIGHT PACK *VERSUS* THE HEAVY APPETITE

By Joel H. Hildebrand

THE problem stated by the title has been one of great interest to me during a camping experience of many years. This interest may be explained, in part, by an appetite very responsive to the stimulus of the trail; in part, also, to my profession of chemistry, which gives a high-brow aspect to what would otherwise be mere eating. The kettle becomes a chemical apparatus, inviting the most carefully planned scientific experiments, the results of which are acknowledged with far more enthusiasm than those which I perform upon the lecture table. I began camp cooking on my first trip, a canoe trip in Maine thirty-two years ago, when I learned that I had had better home training in the kitchen than any of my companions, and decided that I would do well to cook in self-defense. A contributing consideration was that he who does the cooking should not be required to wash the dishes.

A number of canoe trips impressed the fact that every article of food or equipment, however desirable it may seem in camp, is paid for in labor, which, if there are many portages, becomes very heavy. My wife and I, once on a trip through a chain of lakes in northern Ontario, met a party of young men on their first trip who had been persuaded by some salesman to buy everything in the catalogue of alleged convenience to the camper. They even had a quart bottle of lime-juice to make the water from the lakes more palatable. And how they labored at a portage! We began one at the same time as they, finished it, and ate our lunch as we watched them toil.

After moving to California, where pack-animals replace canoes, we found the same principle valid. A few extra luxuries, a dozen tin cans whose contents are mainly water, and one requires an extra animal, that has to be caught, packed and unpacked every day, and perhaps lifted out of the snow in some pass. Indeed, the profound truth that one cannot get something for nothing should, on a pack trip, penetrate even the thickest of skulls.

There are three known solutions of this problem. One is to hire a platoon of guides, packers, and cooks, with the extra animals necessary for everyone's needs. I have actually seen parties thus equipped to transport the tables, chairs, spring-cots and other equipment that seemed to be regarded as essential. I should think that a man who goes about in such a way would feel like the boy who is always accompanied by a nurse. How can anyone so acknowledge his inability to do anything for himself? Of course, this style of travel is not for the academic purse, so I have never tried it. The other extreme is attempted by some who have read how John Muir went about the mountains with a few biscuits in his pocket. I met a man who had been existing for several days on nothing but raisins, and when found was too weak to climb out of the Kings River Cañon. After all, most of us go into the mountains for recreation, not to return to brag of our feats of hardihood, and living for a week or two upon one's stored fat seems rather unnecessary. At any rate, I have never felt it proper to subject my children to starvation diet when one mule will suffice to carry abundant food for two or three people. Think how much happier a mule must be feeding in a mountain meadow than eating hay in a dusty corral! The third solution represents the golden mean between excessive claims of impedimenta, on the one hand, or excessive hunger, on the other; and having been requested to set my solution of the problem before the members of the Sierra Club, I do so very gladly, hoping that it may at least prove suggestive.

Last summer eleven of us, including two young boys, spent two weeks on the trail with but four pack-animals. We, of course, all went on foot. We started with 375 pounds of food (roughly, 2½ pounds per person per day), and the total pack-weight on the animals was 640 pounds. We had hot biscuits with butter every day. We had cake and pie, puddings, lemonade, ham and eggs, omelet, cream of tomato soup, and many other delicacies not ordinarily associated with camp in the High Sierra. Several of the party actually gained weight. The total cost per person for food and his share of the pack-train was almost exactly one dollar per day. This is how it was done:

In selecting the food supply, several principles were borne in mind. In the first place, the daily ration should have an adequate fuel value. This must of course be greater for a hiker than for a

rider, and will vary with the weight of the individual; but there is no harm in supplying plenty, which for the hiker may well total nearly 4000 large calories per day. The following table may serve as a rough basis for estimating the weight of various foods necessary to give a desired fuel value:

TABLE I

Foods:	Approximate number kg. cal. per pound
Starchy foods: cereals, flour, rice, beans, etc.	1650
Sugar	1860
Fats and oils	3650
Cheese	2000
Chocolate	2850
Milk, evaporated, unsweetened	800
Milk, condensed, sweetened	1500
Dried fruit	1300
Fish	1000
Meat	1600

The next consideration is proper balance between the main food constituents: fats, proteins, and carbohydrates (which include starches and sugars). There should also be included foods with a good content of the various vitamins. Our list, given in Table II, suffices for ten persons for a two-weeks trip. We may call this 140 man-days, and readily calculate for any other time and number of persons from the amounts here given. I have divided the materials into groups, to facilitate adjustments according to taste within the different groups, without altering the total fuel value. Tastes vary, and others will prefer a different distribution. I shall make a few comments upon the groups and upon individual items.

Carbohydrates, of course, furnish the bulk of the food. The carbohydrates listed represent a considerable variety, which can be prepared in many different ways, each with its peculiar appeal to the palate. We take along two folding reflecting ovens, each packed in a light wooden box. These enable us to use a great deal of flour, both white and whole wheat. Either kind, mixed with baking powder,

salt, powdered milk, and beaten up into a thin batter, into which is then beaten a little melted butter, furnishes, when baked, hot biscuits that can be eaten without the least urging. Variety can be achieved by stirring in with white flour some rolled oats or corn-meal, or by adding chopped dates and walnuts. Rice takes the place of potatoes, and, if previously soaked, cooks without much difficulty even in the higher altitudes. Spaghetti can be cooked with meat, fish, or cheese and tomato sauce, and has great nutritive and filling properties. No comment is necessary upon the materials for cooked cereal. Large amounts of sugar can be consumed in various ways by one who is doing vigorous exercise, hence the allowance given is liberal.

Nuts have a very high food value, and make an excellent addition to lunches and to cakes and cookies. I may remark here that our own plan is not to unpack for lunch, but to eat hardtack, nuts, cheese, and dried fruit distributed in the morning, before starting.

The various dried fruits take the place of fresh fruits and vegetables in the menu. Dried apples we find most useful and acceptable for cooking; they do not require the amount of soaking desirable with dried apricots. Raisins, dates, and figs are used chiefly for lunches. They should not be the sticky kinds.

The fats have the highest fuel value per pound of all foods. We prefer butter to bacon because of its vitamin content, its taste on hot biscuits, and its general usefulness in cooking. The pasteurized butter supplied in half-pound cans is as good as fresh butter.

For protein we depend to a large extent upon cheese. A whole cheese may be taken, or the smaller one-pound packages, the latter being somewhat more expensive. Cheese is good in great hunks for a lunch and can be melted in liberal amount with spaghetti or rice. We used nearly two cans a day of "Klim," the powdered milk. This is the only proper form in which to carry milk, and of course finds many uses. The canned powdered egg yolk makes excellent cakes, and can be used as scrambled eggs, etc. It is not expensive.

The selection of beverage materials is, of course, dependent upon individual tastes. We prefer cocoa to coffee because of its nutritive value when made with plenty of "Klim." Tea is very acceptable after supper, as one desiccates all day and needs plenty of water. The most highly appreciated beverage on our list is lemonade. As soon as camp has been located and the animals unpacked, we make about a quart of lemonade per capita, using citric acid, sugar, a few

drops of lemon extract, and a few pinches of baking soda. Try it. It can be highly recommended. The sugar is a great restorative to a tired body, and the soda not only generates carbon dioxide, which appeals to the palate, but helps to restore the salt content of the blood.

The miscellaneous list of canned goods includes very little of a watery nature. Water should be dipped from a lake or stream, not carried along in cans. The uses mentioned under "remarks" are more or less self-explanatory. We are not very fond of canned corned beef, and recommend in its stead the excellent canned ham now on the market.

Those who do a great deal of fishing are, provided they catch fish, able to dispense with some of the canned materials here listed, and can diminish the total by an amount corresponding to the weight of fish they expect to catch. We are accustomed to take the fish as incidents of the trip rather than the main feature, and eat up all the food just the same.

Supper should ordinarily begin with soup. The dry "sausages" of Knorr soup are very good, but cost far more per pound than the soup materials which can be gleaned from the list. We can mention especially soy-bean flour, onions, tapioca, Klim, rice, tomato sauce, corn, beef cubes, garlic and celery salt, and peanut butter. The peanut butter should be first creamed with a small excess of water and then poured into boiling milk. Water in which rice or spaghetti is cooked should always be turned into soup.

A ten-pound sack of very mild onions offers a number of interesting possibilities to the cook—fried onions, boiled onions, raw onion sandwiches, onion soup, etc. They furnish vitamins and lots of flavor to various dishes.

We never carry syrup for hot cakes, as the water for syrup can be obtained from the stream. The "Mapleine" flavor and the other bottles of flavoring listed can be protected from breakage by packing in United States Army bacon-tins. We recommend Rumford's baking-powder because it is a calcium phosphate powder and furnishes two desirable mineral food elements.

Although no one else probably will wish to adopt this "grub list" exactly as it stands, it contains items which I have never seen on similar lists, and I hope at least that it will prove suggestive to others who have become aware of the rich rewards to body and spirit of packing in the High Sierra.

TABLE II

FOOD LIST FOR TEN PERSONS FOR TWO WEEKS (140 MAN-DAYS)

	Weight	Remarks
CARBOHYDRATES (DRY):		
Flour, white	20	Biscuits, cake, etc.
Flour, whole wheat	15	Biscuits, flapjacks
Flour, soy bean	2	Soup
Rice	20	Plays rôle of potatoes
Spaghetti	10	With cheese and tomato sauce
Corn-meal	5	Mush, hot cakes (mxd. with white flour)
Oats, rolled	5	Mush, biscuits (mxd. with white flour)
Wheatena	5	Mush
Hard crackers, etc.	20	Lunch
Tapioca, Instant	½	Pudding, soup
Sugar	40	
	142½	
NUTS:		
Peanuts, salted	10	Lunch
Walnut or Brazil-nut meats	5	Lunch, cakes
Almonds, shelled (salted?)	10	Lunch, candy
	25	
DRIED FRUITS		
Raisins, seedless	5	Lunch, pudding, cake, biscuit
Dates, Calif., not pressed	5	Lunch
Figs	10	Lunch
Apricots	10	Stewed, pies
Apples	20	Apple sauce, pies
	50	
FATS:		
Bacon	5	Don't waste the fat!
Butter, 24 half-lb. cans	12	
	17	
PROTEIN:		
Dried beef, bulk, sliced	3	Creamed, or with scrambled eggs
Cured pork loin	3	"Ham and eggs," etc.
Cheese, whole, in box, about	24	Lunch, spaghetti, rice, etc.
"Klim," 2 doz. cans	24	Beverages, soups, biscuits, etc.
Egg yolk, powder, 1-lb. cans	5	Cakes, scrambled eggs
	59	
BEVERAGE MATERIALS:		
Coffee	1	
Cocoa, unsweetened	3	Sugar cheaper when bought separately
Tea, in individual bags	½	
Postum, Instant	½	For children or poor sleepers
Beef cubes, "Steero"		Beef tea, soup
Citric acid	1	Lemonade
Lemon extract, 2-oz. bottle	¼	Lemonade
Baking soda	¼	Lemonade
	6½	
TOTAL	300 lbs.	

TABLE II (Continued)

FOOD LIST FOR TEN PERSONS FOR TWO WEEKS (140 MAN-DAYS)

CANNED (MISCELLANEOUS)	Weight	Remarks
Jams, small cans	4	
Tomato sauce, "Del Monte," 8-oz. cans, 12	6	Spaghetti, soup, etc.
Tuna, large	4	Creamed
Sardines, Booth's, large, in tomato sauce	4	
Baked beans, 1½-lb. cans, 8	12	For quick supper
Corn	4	Soup
Sweet pickles, small cans	4	Lunch
Ham, cooked, 4-lb. cans, 2	8	
Peanut butter	4	Spread, soup
	50	
FLAVORINGS:		
Salt	2	
Nutmeg, 2-oz. can	1	Cake, pudding
Cinnamon, 2-oz. can		Cake, pudding
Pepper, 2-oz. can		
Garlic salt, 2-oz. can		Soup, etc.
Celery salt, 2-oz. can		Soup, etc.
Mapelene, 2-oz. bottle		Syrup for hotcakes
Vanilla, 2-oz. bottle		Pudding, cake
Cocoanut, shredded	1	Cake, pudding
Onions, mild	10	Stewed, fried, raw, soup
	14	
MISCELLANEOUS:		
Chocolate, Ghirardelli's sweet, cakes	10	Lunch
Baking-powder (Rumford's)	2	
	12	
TOTAL	376 lbs.	

THE RATTLESNAKE OF THE SIERRA NEVADA

By Charles T. Vorhies
Entomologist, University of Arizona

JUDGING from experience on two annual outings with the Sierra Club, a few rattlesnakes are almost certain to be encountered on these trips, arousing uneasiness and fear. It is the purpose of this article to discuss pertinent facts concerning the occurrence, habits, and characteristics of these reptiles, precautions against being bitten, and emergency treatment of bites, and to correct some common errors of belief; since more accurate knowledge allays fear and minimizes danger.

Rattlesnakes are the only poisonous snakes of any consequence in California. All other snakes occurring in the state are harmless, if not, as in many cases, distinctly beneficial, and the members of an outdoor organization should be among the leaders in their protection. Snakes are not "slimy," and they are not necessarily "cold," their temperature varying with the immediate environment. There is in fact scarcely any animal cleaner to handle than a snake. Even rattlesnakes are useful destroyers of rodents; but they are sufficiently dangerous to the human race that one can scarcely plead for their conservation.

A number of species and subspecies—i. e., a number of fairly distinct kinds—of rattlesnakes occur within the geographical boundaries of California. Most of them are found only in the warmer and dryer regions, some only in the "desert" localities, while but a single one occurs in the northern part of the state and in the Sierra Nevada proper. This is the Pacific Rattlesnake. It has been long known to science as *Crotalus oreganus;* but more recently as a result of the careful studies of Mr. L. M. Klauber, of San Diego, it has been shown to be a variety, or subspecies, of the widespread Prairie Rattlesnake, and accordingly is designated by him as *Crotalus confluentus oreganus.* It may still be called the Pacific Rattlesnake, and it "occupies all parts of California except the Colorado and Mohave deserts . . . from sea-level up at least to an altitude of 8600 feet in the Sierra Nevada."* I believe but few, however, are found in the

* Van Denburgh. *The Reptiles of Western North America,* vol. ii, p. 934.

LOOKING TOWARD MOUNT WHITNEY FROM MILESTONE CREEK
Photograph by Walter L. Huber

LOOKING TOWARD MOUNT WHITNEY FROM MILESTONE CREEK
Photograph by Walter L. Huber

FIVE LAKES BASIN AND THE KAWEAH PEAKS
Photograph by Ansel E. Adams

Sierra Nevada above 8000, though an occasional stray individual may occur up to as much as 9000 feet in favorable locations, such as southerly exposures. In San Diego County Klauber says it occurs on the tops of the highest peaks. One was killed by members of the 1931 outing party at the edge of the meadow just below the Neall Lake camp of that year. A party of more than 200 persons is almost certain to find some in areas visited below 8000 feet. Pate Valley seems to be a rather favorable locality.

This species may be designated as moderately large, possibly, though not commonly, up to five feet in length. A mature specimen is not thick-bodied in proportion to its length, a recorded forty-two-inch individual being four inches in circumference. It is rather dark in general coloration, with a well-marked diamond pattern on the body, and with yellow, olive-green, brown, or gray ground coloration.

While a rattler of the size attained by the Pacific Rattlesnake must be accounted a dangerous reptile, an inventory of its characteristics contains much that is reassuring to the cool-headed mountaineer capable of intelligent thinking. It is well, first of all, to realize that rattlesnakes are never hunting humans—they do not hunt trouble. While they seem to place some reliance in their powers of defense, and thus in some instances stand their ground if disturbed, they do not show the calm indifference of the skunk to threatened danger, but generally seek safety in retreat. The act of striking is often, if not usually, a reaction of fear rather than of anger or pure viciousness. In fact, an ordinary harmless racer almost invariably puts up a wilder and apparently more vicious fight than a rattler. While general statements are difficult to make, because there are both specific and individual differences in rattlesnakes, the species under discussion is not the most excitable or dangerous. That distinction seems to belong to the Desert Diamond Rattlesnake (*Crotalus atrox*), of Texas, Arizona, and the deserts of southeastern California. The Pacific Rattlesnake in southern California is given credit for a very inoffensive disposition by Dr. Joseph Grinnell,* who says: "In all our experience the rattlers of this region proved to be mild-mannered and inoffensive, seeking to make their escape in every instance, and only striking when worried to the last degree. Neither myself nor my companions had any 'narrow escapes' from being bitten that we were aware of." The following excellent advice from the same source

* Van Denburgh, *op. cit.*, pp. 937, 944.

FIVE LAKES BASIN AND THE KAWEAH PEAKS
Photograph by Ansel F. Adams

as the above quotation may well be thoughtfully considered by outing enthusiasts: "There are lots of interesting things to be learned about rattlesnakes in their native haunts, and we would urge students having the opportunity to avail themselves of it by finding out everything possible. The only danger we can conceive of, that when a rattler is stepped upon unawares, is past as soon as you have caught sight of the reptile. You are at once on your guard. Retain your common sense. Don't go into hysterics and think you must batter the snake to death at once. For it won't run after you! Exercise reasonable caution, give your curiosity full sway, and see what you can find out."

Rattlers are popularly supposed to seek out exposed situations, where they may bask for hours in the sun, and yet those club members who were in Pate Valley in 1931 will remember that one was killed there by only a few minutes' exposure to the midday sun on a sandy area. The fact is that rattlesnakes are primarily nocturnal, or at least crepuscular, especially during the warmest months of the year. At these times they lie in shaded situations during the hottest period of the day, avoiding bare earth and exposed rock, where the accumulated heat would soon be fatal. In spring and autumn, on the other hand, when the nights are too cold for activity, they warm themselves by day on sand or rocks in more or less exposed places, where they can withdraw to partial shade if the heat becomes too great. It is in cool periods therefore that mountaineers need to exercise the most care in hiking or climbing steep grades or more precipitous rocks where the danger of placing a hand on a rattler, or of meeting one literally "face to face," is greatest.

There is but little danger in hiking over level ground, or up slopes on which the hands need not be used to assist, so long as the hiker has even an ordinary amount of clothing on the lower limbs. The usual height at which the strike lands, from level ground, is about ankle to army shoe-top height. Therefore, oxfords or low sneakers afford but little protection. Basketball shoes give a small measure of protection, army or other leather shoes of that height considerably more. Canvas leggings offer additional safety, while fourteen-inch boots are practically completely safe, and leather puttees are as so much armor plate where the rattler is concerned. Perhaps no better evidence of the comparative lack of danger from rattlers is needed than the impunity with which so many of our hikers go about in

shorts or bathing suits. The writer, after living many years in rattlesnake territory without ever having been struck at, still prefers the feeling of safety which comes from the wearing of leather boots or shoes.

Many are the stories which go the rounds as to these (and other) reptiles crawling into campers' beds, occupied or unoccupied, but this writer has yet to authenticate any such case, and he has spent many a night on the ground in the country of the rattlesnake. A friend who was a member of a Sierra Club annual outing some years ago tells of a rattlesnake being found in boughs placed beneath the bed of certain members of the party. Happily, such cases must be rare. If perchance you have heard that a horsehair rope placed on the ground so as to encircle the bed is a protection against rattlers, you may as well know that it is futile. A rattlesnake will crawl right over such a barrier—and why not? It can crawl with impunity across a barrier of cactus.

Rattlesnakes are often found at rest in a nice neat coil, and so are popularly reported to have been "coiled to strike." That this is far from the truth may be readily demonstrated if only a little calm observation is made to replace hysteria. Disturb one rudely and the first thing it does is to rapidly unloose these coils, quickly assuming a posture which will be readily recognized as a fighting pose. If really angry or excited, the anterior one-third of the body is reared somewhat above the ground and bent into sharp but graceful curves like a letter "S," or a succession of them—that is, each bend is in the opposite direction from the one before or behind. If reared high, and very threatening, the head and neck may be tilted downward again from a higher curve farther back. The tongue plays in and out, and the rattle sounds a once-heard-never-forgotten buzz. The rattle may be within the curves and loops, or readily visible somewhere outside them. The posterior two-thirds of the body will be seen to be in coils or loops forming a firm base of support from which to launch the strike. A short stroke can be quickly made from almost any position by drawing the head back a bit, but the longest and most effective strike is doubtless that from the position described.

Now, a rattlesnake cannot leap, and cannot strike its own length. Its most effective stroke is the shortest, both the power that goes into it and the accuracy of aim diminishing with distance. One-third of its own length is about the greatest reasonably effective range, and

certainly beyond half its length lies safety. Therefore you do not need a "ten-foot pole" with which to kill, or experiment with, a rattler.

In a recent story in a popular weekly magazine a well-known writer drew for his readers a word-picture of a vicious brute of a rattlesnake, coiled ready for action, its head swinging from side to side, mouth wide open, and hissing venomously. In fact (and the writer hopes the reader will verify this at the next opportunity), the head swings only so much as is necessary to keep a watchful eye on the moving object which engages its attention. The rattlesnake *never* opens its mouth before launching the strike and the writer has never heard this kind of snake hiss. Of course, the hero of the story "blew off" the head of this dragon with his trusty six-shooter in spite of its active movements.

The "bite" of the rattlesnake is a combination of acts which takes place with astonishing speed, often too fast for the eye to follow. As the head moves forward the mouth is opened widely, an action which erects the fangs from their resting position against the roof of the mouth so that they point forward. The jaws are capable of opening until the lower jaw almost forms a line with the upper, instead of an acute or even obtuse angle. The forward-pointing fangs thus literally stab the victim, and are partially imbedded if the aim be accurate. A convulsive closing movement or "bite" instantly follows, and is, usually, as quickly released. But this biting movement compresses by muscular action the venom glands of the upper jaw, and portions of venom pass along the ducts to the bases of the hollow fangs and through the fangs into the wound, exactly as a hypodermic injection is made. Nature gave the rattlesnake a hypodermic needle long before man invented it. Removal of the fangs renders a rattlesnake comparatively harmless, but only temporarily. New fangs in a short time move into position to replace those extracted, a provision of nature to care for the losses which normally occur in striking prey. There is no method of removal of the poison glands. To take them out by an operation would nearly destroy the sides of the head.

Rattlesnake venom is a yellowish, somewhat viscous liquid, which has, according to some authorities, a characteristic odor. The writer is unable to detect any odor in it and believes the reported scent to have come from the body of the snake. Venom in dried condition retains its poisonous qualities for an indefinite time. Snake venom is not a simple poison, but a mixture of toxic substances having

different effects on the tissues of the victim. These toxins chemically are organic, belonging to the complex nitrogenous compounds known as proteins. Since our ordinary nitrogen-bearing foods are proteins, it need not surprise us that rattlesnake venom is harmless when taken into a normal, uninjured mouth and stomach, for digestion breaks it down. Its toxicity depends upon its injection directly into the tissues or blood-stream.

Some of the toxins are cell-destroying (cytolytic) and others are nerve-poisoning (neurotoxic), and upon the relative proportions of these substances in the venoms of different species depend their varying effects. Venom is also anti-bactericidal, which is to say that it destroys the protective substances contained in blood and body tissues and thus makes them more susceptible to germ infection. Therefore extra precautions against infection of the wound made by a rattlesnake should be taken in treatment.

It may be here emphasized that these reptiles have this remarkable venom not primarily for attacks on larger animals, nor even for just defense, but as a means of readily killing prey. The rattlesnake strikes its prey, in the manner described above, and then awaits the death of the victim before attempting to swallow it.

The amount of venom required to kill a victim of snake-bite is perfectly definite for each species of snake, and is directly proportional to the size of the victim. Therefore a child is in greater danger from rattlesnakes than an adult, and the minimum lethal dose for a 200-pound man would suffice to kill four children whose combined weights were 200 pounds. The mouse or other small rodent on which a rattler registers a direct hit dies in a few seconds, while the horse or cow that is accidentally bitten suffers a temporary inconvenience.

Since the quantity of venom received is of such importance, let us note some of the factors influencing the amount. Naturally, the larger the snake the greater the actual dose which may be injected. Whether the snake has recently used its venom either in defense or in killing prey determines to an extent its power to kill. When the glands are artificially emptied, as in "milking," it takes about two weeks for them to become fully recharged. The depth of clothing covering the bitten part has a direct effect also. Three or four thicknesses of ordinary cloth are just so much more effective than a single layer in reducing the amount of venom, and particularly the depth of its injection. The distance at which the strike is delivered also

affects the depth of injection and probably to some extent the actual amount delivered. At very close range the rattler is more dangerous than at the near-limit of his reach, because of both force and accuracy. As the writer has observed the feeding (and striking) of many rattlesnakes in captivity, he has had frequent occasion to note surprising inaccuracy of aim, particularly at the longer ranges. A glancing blow may result either in shallow penetration, or in penetration of but one fang, which naturally means less venom injection.

Operation of one or more of the above factors results in comparatively few rattlesnake-bite victims receiving a lethal dose of venom. Such statistics as are available indicate that less than thirty-five per cent of persons bitten by rattlesnakes in the United States receive a lethal dose; that is, at least two persons of three bitten, perhaps three out of four bitten, would recover without any treatment because of insufficient venom. In these facts we have the explanation of the prevalence of belief in useless or quack remedies. Kerosene, a mud bath, whisky, application of a "mad-stone," or other worthless treatment will be followed by recovery if less than a lethal dose of venom was received, and thereafter the victim and his friends swear by the efficacy of the particular remedy used, not realizing that he recovered not because of the remedy, but in spite of it.

Well does the writer remember as a boy in the Mississippi Valley the excitement attendant upon the injury and safe recovery of a barefoot youth who was bitten by a "water snake" while fishing. He was given a drink of whisky and felt no ill effects (from the snake-bite). Although this water snake was a perfectly harmless, non-venomous species, whisky was given credit for the "cure."

Upon the above principle also, apparently, was potassium permanganate for so long recommended by physicians and other scientific authorities as an antidote for snake-bite. Recently, however, careful experimentation seems to have shown rather conclusively that permanganate is not a dependable remedy. Throw away your permanganate kits, fellow members of the Sierra Club! Mine has gone into the limbo of the past. Permanganate, in a strength that might be of value in killing venom, kills tissues, and alone, without any venom present, will cause terrible destruction and sloughing of the flesh. In solution so dilute as to be harmless to tissues, it is worthless as a venom-destroying agency.

This brings us to the subject of treatment of rattlesnake bites, and,

since the writer is not a physician, he will devote attention chiefly to what may be termed, primarily, emergency treatment. Though it is altogether possible for non-medical persons to save lives by these measures alone, every case of venomous snake-bite should be gotten to a physician for observation as soon as feasible, and should remain under medical care until recovery is complete.

1. *Keep cool:* While rattlesnake bites are very painful, only a small percentage of them are fatal, even without treatment.

2. Apply a tourniquet at once between the wound and the heart, tight enough to hinder venous circulation, but not necessarily tight enough to shut off arterial flow. A stout band or strip of rubber is good and can be most quickly applied.

3. Open the fang punctures by cross cuts three-eighths of an inch in length and one-eighth of an inch deep, with a sharp sterile knife. (A safety-razor blade is easily carried in a sterile package.) Suck the wound, by mouth if necessary. It is best to have a suction bulb, or to apply suction mechanically as soon as possible, since long continued suction has been proved efficacious. Pocket suction outfits for this purpose can be had cheaply.

4. Loosen the tourniquet every 20-30 minutes for two or three minutes.

5. If antivenin be at hand, administer at once according to directions and remove the tourniquet. If antivenin be not at hand, remove the tourniquet completely when the repeated loosenings prove to have no bad results, such as fainting or weakening of heart action.

6. Keep the patient quiet. Give a stimulant if necessary (in case of weak heart action or fainting). Black coffee, aromatic spirits of ammonia, and strychnine are stimulants. *Alcohol is not a stimulant.* (Plenty of alcohol will neatly finish what the venom has started.)

7. As soon as possible get to a physician, who should continue the suction treatment, give antivenin if not previously given, and care for the wound to prevent infection.

Incision and suction have been proved to remove venom in bloody serum for hours after the bite is inflicted. Antivenin counteracts the venom which has gotten into the blood-stream, and will give beneficial results many hours after the injury. Be careful not to slash indiscriminately or too deeply in making incisions for suction and drainage, especially on hand, foot, wrist, or ankle, as serious damage to tendons may result. Suction should be kept up for twenty minutes

out of each hour over a period of fifteen hours or until swelling ceases. Many serious cases of rattlesnake bite could be saved by proper use of this treatment alone, though the writer believes in antivenin as an additional precaution and relief. The physician should have, or be able to secure, *antivenin.*

Very few bites are quickly fatal. Most of the fatal bites do not result in death before eighteen to forty-eight hours; so there is ample time for treatment. The writer has come to believe therefore that the individual should have the suction kit. Antivenin, being too expensive to be generally carried by the individual, may for the most part be left to physicians, drugstores, and hospitals to have on hand for supplemental treatment.

Don't run or get overheated. Circulation increased by exercise serves to distribute the poison more rapidly through the body. Don't injure the tissues by injecting potassium permanganate, which is now known to be of no value as an antidote. Do not depend upon snake-bite "cures" or home remedies commonly used. They are of no value. Do not cauterize the site of the bite with fire, strong acids, gunpowder, or the like.

Don't forget *strong black coffee,* and don't take whisky or other alcoholic drink.

THE HEAD OF THE BIG ARROYO — KAWEAH GAP AT THE LEFT
Photograph by Ansel E. Adams

HALF-FROZEN LAKE BENEATH THE CLIFFS OF EAGLE SCOUT PEAK
Photograph by Ansel E. Adams

HALF-FROZEN LAKE BENEATH THE CLIFFS OF EAGLE SCOUT PEAK
Photograph by Ansel E. Adams

BUTTERFLIES—TRY AND GET THEM

By Laurence Ilsley Hewes

SIX hundred and seventy butterflies in America! Less than seven hundred distinct varieties north of Mexico — but try and get them! On a wild winter's day in Omaha, a veteran butterfly collector showed me his own thousands of accurately labeled, immaculate specimens. For an hour he pulled out drawer after drawer of his fascinating exhibit. He had complete series of many varieties, yet less than five hundred distinct species. His were faultlessly pinned, perfect insects, beautifully arranged. "It's the last third that evades the net," said he.

Train time cut short the show. "You have done a splendid job," I said. "How long have you been collecting?"

His ruddy face beamed. "Fifty years. I began as a boy."

He began as a boy! How often that is the case! As boys they begin collecting butterflies. As men, some very few go on. A happy few persistent systematic collectors — those who get to know their field and become indeed advanced collectors.

My veteran friend closed his steel pest-proof cabinet, and we walked to the station. He was already looking forward to spring in the Mississippi Valley. His collection recorded the golden hours of fifty summers, and he was eager for more. He explained that he rode his hobby, but never did it ride him. He spoke of exchanging specimens with correspondents from Florida to Alaska. He told anecdotes of great collectors. When, at parting, I evidenced humility at my own desultory efforts through scattered years, he smiled:

"Collect just as you please," said he. "It will tire you sometimes, but never let it bore you—then you will always come back to your collecting. I envy you a trip to California—there are two hundred and fifty varieties there."

Make no mistake about the real butterfly collector. His is no lily-fingered pastime. He is not—distinctly not—the bald-headed, crazy crank of the cartoonist. My acquaintance among collectors of lepidoptera numbers a policeman, an ex-prizefighter, a man who climbs telephone poles, a jewelry designer, physicians, bankers, and even

engineers! To all of them butterfly-collecting is recreation, exercise, and an enduring cultural interest. The advent of the automobile has greatly increased their opportunities and their numbers.

They must get their specimens outdoors—in sunlight. Their hobby involves a study of climate, geography, and botany. It requires hiking that will test the endurance of the hardy, or patient waiting that will reward the invalid. It carries men to the north lands or to windswept peaks of the Sierras or to the Everglades of Florida. I saw one wade an Idaho mountain stream to capture a female of the Leto Dryad—a lovely mountain silver-spot. You learn of specimens found only on the hot Mohave desert, others that fly only on the peaks of the Colorado Rockies. No—if you are really after butterflies, you can smile at the "he-man stuff" of the trout fisherman or the hunter!

My collector friend of fifty seasons found his butterfly chase never in vain. His record is complete, and it is never cooked or eaten. His collection is indeed a thing of beauty. There are for him and his colleagues no game laws or closed seasons. Their outfit of delicate bag-net and collection-box is simple, the costs trifling, and the adventure is endless. Truly it is endless—if living collectors be allowed their testimony. I carried introductions to California collectors. In March, in Santa Cruz County, we went afield with a gentleman past seventy. We were after the Veined White, those earliest fragile white butterflies with the sooty veins. They emerge in a few special cañons along the Pacific Coast. Four of us took more than eighty specimens; but the number included three only of the rarer lemon-yellow form of the female.

Why so many? Because into the well-built collection go finally a series of only perfect specimens to be culled from the catch. Because, also, *venosa* is a good exchange—it is, as one gets to know, extremely local. The odd and interesting fact is that the second brood of these butterflies in May is of an entirely different marking—whiter and with veins almost erased, and is called *castoria!*

And now the secret about these six hundred and seventy is out! That, it is true, is the number of the distinct varieties; but there are sub-varieties or forms that run the numbers into many more hundreds. *Venosa* and *castoria* are only forms of *napi,* all simple white butterflies belonging to the group (genus) *Ascia,* which includes the common cabbage butterfly of which you have seen thousands.

One finds that butterfly-collecting has its anecdotes, its human

side, its gossip, and its scandals. In California there is the Lorquin Society, named for a Frenchman who came in 'forty-nine with the gold rush. He discovered many new varieties and took them to France. There Boisduval, then a dominant lepidopterist, named them and described them in the entomological journals and today many bear his name. Miner Lorquin's own name, however, is attached to a beautiful black-brown butterfly, with bands of white and with yellow-tipped wings. It is Lorquin's Admiral — *Basilarchia lorquini*—found all up and down the Pacific Coast.

They will tell you in San Francisco that in the great fire following the earthquake of 1906 several valuable collections were destroyed, among them the notable Wright collection of butterflies of the Pacific Coast. There is also a story, which can't quite be verified, that in that San Francisco fire was burned one of the two then existing specimens of the butterfly known as the Yellow Parnassian. It is said that Wright had lent the other to Edwards, the great collector of his day. They came from Alaska, these two specimens, perhaps descendants of Siberian ancestors. The single specimen now in the National Museum collection came from the great collector, Strecker. These Parnassians are, in general, medium-sized white or translucent-winged butterflies, with red or orange spots within dusky rings and with dark border markings. You see them in the higher western mountains, but never yellow ones. This particularly rare yellow Alaskan is called *Parnassius eversmanni.* In the Strecker collection at the Field Museum are several specimens.

In San Francisco formerly there flew over the sand-dunes toward the sea a butterfly originally described by Boisduval and called *Cercyonis sthenele*—one of the satyrs, grayish brown, smallish, inconspicuous. This butterfly is now said to be extinct—but is it? For years collectors have sought it in vain. Some deny that it was found in the sand-hills, and look elsewhere. They are encouraged by the reappearance, after thirty-five years, of the once believed extinct *Lycaena xerxes,* a small blue butterfly that miraculously reappeared a few years ago in the San Francisco Presidio! I have taken numbers of this little butterfly, once rated as almost beyond price! But his San Francisco "locality" now extends less than ten acres!

To butterfly collectors this word "locality" is indeed a magic word. While certain varieties, like the Monarch, are everywhere, there are species that are greatly restricted in range. So collectors

often follow a hard course for localized specimens. Men of the enthusiastic group of butterfly people around Los Angeles journey hundreds of miles into the desert for certain spring specimens. There is a lovely orange-tip in Arizona that often evades pursuit; for spring in the desert is brief and beautiful, and the days of insect flight are short. An unlooked for rain may delay the catch a year. To the expert, frayed, rubbed, torn, or faded specimens are useless, so fresh specimens of smaller butterflies that fly only for a few days in remote localities may elude the net for many seasons.

But it isn't the distant or difficult locality alone that brings the exciting adventure. Right in his dooryard my Omaha friend has collected stray Texas varieties. In Oregon, while the automobile was stalled, I collected a dozen rare checker-spots—small black, white, and red butterflies—that proved to be of a new species. They were in a gravel-pit by the roadside. That is one of the fascinations of butterfly collecting—the unexpected. But you need always a net, a cyanide collecting-bottle or box, and the summer sun. You almost never fail to add specimens to your growing collections. It's a mistake to look for rarities—one collects what is flying. The rarities turn up.

You find them described—these rare ones—with the others, in books by Edwards, Scudder, Holland, Wright, and Comstock. There are plates—many beautiful colored ones. You see what is pictured, and when the day comes that your lucky net holds the long looked for specimen you will get your thrill. An Eastern friend admitted he would never forget his first catch of that short-tailed swallowtail called *indra*. It was in Yosemite Valley, before breakfast. He was led a chase all over the meadow opposite Camp Curry, jumping brown brooks and crossing bogs, but to him *indra* was worth it. *Indra* flies briefly in Rainier National Park and near Salt Lake, and some day my friend hopes to add that black form discovered by H. Edwards in the San Bernardino Mountains—*pergamus,* Wright called it.

Wherever a collector collects, there is sport. He can make it as strenuous or as gentle as he likes. For a beginner, like a banker who recently started, it may take a season or two to get good specimens of the common butterflies of his own neighborhood; but in most vicinities it will require many seasons to exhaust all the varieties and forms. An observant collector will find in his garden patch in New England "coppers" that the Pacific Coast man can get only by exchange. Behind his house, in the warm sun after a rain, a dozen varieties will

flit over the hedge. On the lilacs, the zinnias, and the phlox of the Eastern gardens, feed gorgeous butterflies. Perhaps there is no more beautiful butterfly in many areas than the Purple Admiral, or *Basilarchia astyanax,* frequently found flying about the willow trees of the Atlantic States. His cousin, *arthemis,* with white bands, flies farther north and changes the width of his bands as he goes west across the plains to the far Montana streams and Glacier Park.

"You get this way over butterflies!" said an architect friend. "They come to mean country and flowers and weathers and altitudes. Soon you are a bit of a botanist; you know the snow-line plants of the mountains, wild buckwheat and the vegetation of the summits; the march of the seasons in far-spread latitudes. . . . As a field sport," he continued, "butterfly-hunting may be more exciting than angling."

"Yes," said his companion,"I have fished in the Yaak River in Montana, and have caught big trout in Clear Lake, Oregon, and huge pickerel in the St. Lawrence; but the recollection dims beside the sport of certain rare days with a net at the right time and place."

"Once it was at Corpus Christi, after a rain," he continued. "There were swarms of varieties almost within the city limits. The Texas mesquite was alive with giant swallowtail *cresphontes.* In the mountains of southwest Virginia I once took in one sweep of the net ten lovely specimens of the eastern swallowtail *turnus.* There were dozens crowding about something in the road that proved to be stranded toad's eggs slightly fermented. More memorable yet is an afternoon in Jackson Hole, Wyoming, when mountain meadows were distracting with butterflies. There I took the rare checker-spot called *gillettii,* and Weidemeyer's Admiral, for which I'd waited years."

"But if you are a real hunter," he went on, "try for an *oregonia,* another swallowtail. You find him along the middle Columbia River. Here is game for the skeptical; this brilliant yellow and black *Papilio.* He is rather scarce. But in a certain cañon, year after year, in the arid summer heat, he may be taken in late June. Imagine a gorge with the west wall a sand chute covered with black rock float. The temperature in the shade of a willow in the bottom may be above a hundred. The east wall is terraced basalt. Quietly you move along among the blistering rocks with the white-sand skyline six hundred feet above. *Oregonia* is a crisp, sharply marked denizen of the arid wind. He is utterly devoid of leisure; his flight is bold and rapid. The cañon thistles invite him. Far down the steep slope, near the

thread of the drying streamlet, grow these scattered blooms that are his undoing. Over the sharp sand edge above drops suddenly this brilliant raider. Abruptly he sweeps upward, pauses, and drops back. Around and across he flashes his quick reconnaissance, then for a few seconds he hovers, nervously pulsating splendid wings over the cloying sweet. You must be alert or he is gone. Choose a high position so you may dart downward. The up-climb in the loose sand will quickly exhaust you in this heat. For a moment the insect is utterly oblivious. If your movement is swift and careful, he is in your net!"

And yet a more scientific way to secure *oregonia,* and other varieties, is to raise the butterfly from the caterpillar. There is a German hermit looking for these caterpillars as he tends his goats along the rocky margins of the mid-Columbia. He knows that the female *oregonia* places her eggs on the tall *Artemisia,* a plant of the wormwood family. The banded caterpillar, or larva, matures in September, as do the larvæ of many larger butterflies. The next stage is the yellowish ashy chrysalis which overwinters.

At Truckee, California, in the Sierras, some years ago a girl became well known as a butterfly-raiser. There is a checker-spot *macglashani* that bears her name. This butterfly is much sought after—even from England come calls for specimens; it is another very local form. The food-plant of the caterpillar is the key to locality. Only on its own particular plant or plants will butterfly larvæ feed—they will die rather than eat substitutes. If, for example, you would find the eastern checker-spot *phaëton,* you must locate the turtlehead plants in moist places. Collectors exchange endless information about such things, and their published journals carry on the story in minute detail. In Washington, last winter, from a trained scientist I learned of strange cases of "spot" distribution, of far western forms in Massachusetts, and of a Gulf of Mexico species once found on the Columbia River.

You are surprised, also, to learn that butterflies live a dangerous existence. From the time the egg is laid until the butterfly emerges from the chrysalis, there are other insects constantly alert to destroy butterfly lives. Undue drouth or late spring cold annihilates many species which emerge early. Birds take toll of larva and of mature insect. See the floating blue wings in puddles of wooded roads! The lives of most varieties are short—from a few days onward, as the size and vigor of the varieties increase. The life cycle is the egg; the larva,

or caterpillar; the chrysalis from which emerges the mature insect, or imago. Most butterflies pass the winter in the chrysalis form. The admirals (*Basilarchia*) winter singly as tiny caterpillars, in a small stocking spun within a bit of leaf of willow. They can endure the coldest weather, swinging above the snow with head exposed, and without question frozen stiff. You can collect these larvæ in midwinter and raise immaculate specimens by supplying food when spring comes.

There are a very few people who raise butterflies for sale. In London there are firms that buy butterflies for collectors from all over the world. Yet there is little commercialism. Some years ago a man sold quantities of the small green sulphur butterfly that swarmed near Tioga Pass, above Yosemite Valley. This butterfly, *Eurymus behri*, is a rarity that flies only for a few days in one locality. There is a legend that Indians killed this man!

Naturally, California has many varieties because of her range of climate and of latitude and altitude. She has many collectors, too, after her hundreds of different species. There was, before the earthquake, a notable group around San Francisco Bay. They were led by the late Dr. Hermann Behr, for whom are named several varieties beside the green *eurymus* of Tioga. There is still a group of collectors who meet at intervals in San Francisco to discuss their hobby.

They will tell you of the time when you could collect on bushy hills that are now Chinatown, of the early days of San Francisco Academy, of the vanishing of the checker *baroni* because of real-estate development, and of places to hunt Behrens' Silver-spot in the north.

There is constantly new interest in butterflies and possible new values. Have you heard that some are carnivorous—that their larvæ eat ants' eggs, that the male argynnids are fragrant to sensitive nostrils, and that several varieties migrate in swarms?

No collector can tell you much about butterfly migrations. They just occur. Most frequently, perhaps, is the yearly migration of the milkweed butterfly, or the Monarch. He ranges from Maine to California. He goes south in the winter and in favorable seasons may go in swarms. He went so along the New England coast in the fall of 1899. He sagged the tree branches with his weight. The insects were in perfect condition and could be gathered with the fingers.

In 1926, on incomparable Mount Shasta, swarmed the California Tortoise. A new collector encountered them in twos and threes as he

started to climb toward Alpine Lodge. His path was through the wild lilac (*Ceanothus*), on which the larvae of the swarming butterflies live. That sunny day the tawny and black butterflies at first came straggling in threes and fives, and then in dozens, till soon the air was vivid with their flight. They later came down off the mountain in thousands—seemingly hundreds of thousands—the air filled with their hard sweeping flight. They covered the sheer granite walls of a ravine in armies, resting briefly in the sun, and at the 8000-foot level near the August snow-line they disappeared. A swarm of the West Coast Lady Butterfly (*Cynthia carye*) invaded Salt Lake City in 1923, flying north in myriads.

These swarms are a rare sight, but the butterflies are not rare. The really rare American butterflies are subject to dispute. One old collector rated *andromacha*, a spotted beauty from Florida, as his rarest specimen. A specimen of extinct *sthenele* is, of course, beyond price. There are sports, or aberrations, that have never been duplicated. A gentleman in Pasadena collects such aberrants—some most precious.

For the scarce specimens one often must go far. Parts of Arizona offer the collector a paradise. Recently died Pohling, who for years worked close to the Mexican border. In the Baboquivari Mountains he found the great white waxy-winged butterflies with the large lemon-yellow spots—*Amynthia clorinde*. He had intimate knowledge of locality, which is unfortunately now lost. Many rare specimens in notable collections came from his net.

And there are notable collections. In Decatur, Illinois, for many years was the outstanding collection of the late Dr. William Barnes, housed in a specially built concrete building, with devices for correct temperature and air dryness, a truly marvelous achievement. Here in vast array were hundreds of thousands of specimens of butterflies and moths that involved years of patient collecting of many of the Doctor's agents. This collection was purchased for fifty thousand dollars by the Federal Government and moved to the National Museum in a special express car. Skilled men worked two weeks in Decatur ramming home the three hundred thousand insect pins, so that no specimen should jar loose in transit!

In the Field Museum, of Chicago, is the great collection of the late Dr. Herman Strecker, originally purchased, thirty years ago, from his heirs for twenty thousand dollars. Dr. Strecker, too, began collecting as a boy in Pennsylvania. The collection of the late Dr. Skinner is

HAMILTON LAKE, ON THE NEW HIGH SIERRA TRAIL.
Photograph by Walter L. Huber

LOOKING NORTH FROM THE SIERRA SAN PEDRO MARTIR
Dawson, Clyde, Robinson, Jones, Brem

VALLE DE LA GRULLA
Photographs by Nathan C. Clark

in the Philadelphia Academy of Sciences. In the Carnegie Museum at Pittsburgh are the splendid collections of the late W. H. Edwards and of Dr. W. J. Holland. Elsewhere are others less notable. But in the National Museum at Washington is now a master collection.

The truly great collections of American butterflies are of utmost value to science for comparison of specimens and determination of possible new varieties. Most collectors hope to discover some new butterfly. It happens, but not as frequently as formerly. Yet collectors may still hope for new forms of known varieties. The lucky finder of such a new form or variety has it "described" and named. This specimen then becomes a "type." Collections with many original types are correspondingly valuable. The original of the extinct *sthenele* is in the safe of the California Academy of Sciences!

The Grand Canyon yields many varieties. Here is Holland's Swallowtail at Indian Gardens. Lower, near the mouth of Bright Angel Creek, in the canyon's granite depth, flies the common *Papilio philenor* — the Pipevine Swallowtail — one of our few iridescent-winged butterflies, blue and black. I have taken them in Virginia and Arkansas and a form in the hot Sacramento Valley, where they feed on the wild dutchman's pipe. There, sometimes, in the larva stage, they cross the highway in armies. They like also the heat of the Lower Sonoran Zone of the Grand Canyon.

It may be that west of El Tovar, beyond the Tusayan Forest, is some undiscovered new species for you or me. It is a remote land, there below the sky-blue water of the falls down Supai way. In late October, far down the Canyon, are glorious jasmine blossoms and rare miniature grapes in a sea of barren vines. Near by is the delicate foliage of the tornilla mesquite and the luscious blood-red cactus-fruit flourishing in semitropic sunshine. In this strange land the collector can easily believe in new things. Few white men have been beyond the last fall of Havasu Creek—what is there? Perhaps that wrinkled old Supai woman knows something about it. Perhaps her grandchildren will show me a new race of that gorgeous brown and white and crimson form of the California Sister that flits among the rocks and dwarf oaks. What in past ages may not have migrated down Kanab Creek from remote southwest Utah across the Colorado? There must be the unusual in this mysterious Supai country—this land of contrasts of barrel-cactus and apricot, of fig and pumpkin. There may be new species of butterflies there—try and get them!

THE ASCENT OF EL PICACHO DEL DIABLO

By Bestor Robinson

"*Es imposible, Señor.*"

This was the opinion of my Indian guide as he stood on the edge of the mighty eastern escarpment of the Sierra San Pedro Martir and pointed to the sharp pyramid of El Picacho del Diablo rising precipitously nearly 10,000 feet from the desert, its cream-colored granite gleaming in the late afternoon sun. Undoubtedly, he inwardly added the comment *"loco Americano"* when I told him of my desire to climb this 10,500-foot peak, the highest in Baja California. Field-glasses failed to reveal even a pretense of a cairn on its summit.

This peak bears two strangely contrasting names. To those who view it from the west, its ruggedness and forbidding aspect have suggested the name here used, "The Peak of the Devil." Early explorers viewing it from the Gulf of California dubbed it El Cerro de Providencia ("The Mount of Providence"), probably because of its winter crown of snow.

It was a scene of wild beauty. For many miles north and south the mountains dropped off precipitously to the barren wastes of the San Felipe Desert, forming a fluted wall averaging more than a mile in height. Beyond the fringe of desert lay the blue waters of the Gulf of California, and beyond those waters, in the clear desert atmosphere, more than a hundred miles away, the mountains of Sonora formed a background for nature's picture. Out of the desert rose the black skeletons of ancient mountain ranges, half-buried in the débris of their own disintegration. To the north, the Colorado River fingered its way in many rivulets across flats of black mud, the dump of the Colorado's Grand Canyon excavation. To the south, the Gulf of California stretched with seeming endlessness to tropic seas. In the foreground, detached from the main range by a deep chasm, El Picacho del Diablo stood alone, the commanding figure in this masterpiece of nature.

This was in the fall of 1930 on a hunting expedition. We had come overland from the Pacific Ocean, following the trail blazed by

the padres centuries ago. For four weary days Dr. R. I. Newell, Porter Shaw, Chester Hunt, and I had ridden over the sun-baked ridges that lie between the ocean and the San Pedro Martir. Each day we were up at the first streak of dawn, and the last rays of light had left the western sky before we tumbled off our mules, tired, aching, and with various portions of our anatomy the worse for wear. Water-holes were few. One night we had no water. The mules, resenting this, started for home. Chasing thirsty mules through sagebrush in the middle of the night, with the nearest town one hundred miles away, is an excellent diversion on a hunting trip.

It was interesting to examine the deserted ruins of Mission San Pedro Martir and listen to our guide repeat the stories current in this region of the fabulously rich mine which was abandoned and concealed by the padres when their properties were confiscated many years ago. Interesting also were the falls (El Salto), where the Rio Santo Domingo, the largest stream in Baja California, makes a plunge of many hundreds of feet off the western escarpment of the San Pedro Martir plateau. Below these falls are found the little-known Nelson rainbow trout (*Salmo Nelsonii*), thriving in warm water which our fishermen would pronounce good only for catfish. These trout might well be transplanted to the lower reaches of our Sierra Nevada streams.

The Sierra San Pedro Martir is in reality a high tableland, approximately forty miles long and ten miles wide, lying on the eastern side of the Baja California peninsula, approximately 150 miles south of the international boundary line. The eastern escarpment, as previously indicated, drops precipitously to a desert fringing the Gulf of California. The western escarpment, which is neither so high nor so precipitous, grades off into parallel foothill ridges to the Pacific Ocean. Ignoring minor secondary ridges, the plateau could well be likened to an elongated saucer. The interior of the saucer averages between seven and eight thousand feet in elevation, gradually ascending on the eastern rim to summits exceeding 10,000 feet in elevation, and likewise ascending to the western rim to summits one thousand feet lower.

The outer rim of this plateau is barren and inhospitable. In striking contrast, the interior of the saucer is a veritable fairyland. It consists of a series of valleys or meadows, small and numerous to the north in the region known as Vallecitos, but increasing in

size to the south so as to average in area several square miles each. Between these meadows are low rolling ridges covered with a mature growth of Jeffrey pine, with a sprinkling of incense cedar, piñon, and cypress. The higher ridges to the east are well covered with quaking aspens, lodgepole pine, and white fir. Many of these species, probably as a result of their long isolation and changed environment, have acquired characteristics markedly distinguishing them from their brothers in the California mountains. Particularly is this true of the white fir (*Abies concolor*), which on first inspection is apparently a different species with its heavier needles and different tone of green.

The plateau is exclusively granitic, with remnants of metamorphosed sedimentary rocks appearing on both escarpments. Ages of erosion have left weird formations scattered over the entire area. Weathered ridges, with their towers and huge blocks piled one on top of the other, suggest a playground for the children of giants. The meadows, especially Valle de la Grulla, are strewen with boulders exceeding in some instances one hundred feet in diameter. Such boulders are too large to be of glacial origin; they are probably the result of residual erosion. It is a sparsely settled region. So far as we were able to determine, there were no permanent residents on the entire plateau, although in the summer there were a few *vaqueros* camping on the larger meadows with their cattle. The density of population is indicated by the fact that on this first trip of two weeks we saw but one Indian and one group of four *vaqueros*.

And so, in the fall of 1930, on the last day of our stay on the plateau, while my brother nimrods were trying to stalk wildcats and mountain-lions, I was standing in admiration of the sheer beauty of El Picacho del Diablo, promising myself and the peak that I would return at the first opportunity and yield to the irresistible urge to attempt its ascent.

That opportunity came in June, 1932. With Norman Clyde along, to insure the success of the expedition, and with a group of younger rock-scramblers from Los Angeles who have been leaving their names on the tops of the more difficult peaks of the Sierra Nevada, we set out for the Mexican border in two automobiles. The party, as finally organized, consisted of Norman Clyde, Nathan Clark, Richard Jones, Walter Brem, Bestor Robinson, and James Linforth, the last an amateur naturalist who came along to fish and botanize.

LOOKING TOWARD THE SAN FELIPE DESERT FROM THE EASTERN SIDE OF EL PICACHO
Photograph by Nathan C. Clark

THE WESTERN FACE OF EL PICACHO DEL DIABLO
Photograph by Nathan C. Clark

Through the riff-raff town of Tia Juana, a good road leads down the coast as far as Ensenada, the southern limit of ordinary American penetration. South of there life is much the same as it has been for centuries. Each little valley has its handful of adobe huts, clustering around a mission, and surrounded by their small fields of corn, beans, and squash. The desires of the Indians and Mexicans are few, and those few desires seem to be satisfied. There are no booms and no depressions, but only a simple life that has produced a happy and kindly farmer-folk.

The road is little more than the addition of one rut paralleling the ancient trail of the padres, as it meanders through the hills from mission to mission. Turning off the "main highway," shortly after crossing Rio San Telmo, we headed inland to Rancho San José, at the base of the Sierra San Pedro Martir, a route which was shorter than that of two years previous and had the additional advantage of leading through different country.

There were no road-signs and almost as few houses on this side-road, causing us to wander up wrong washes and through fields of sagebrush and cactus, following dim trails, until arrival at our destination seemed about as probable as a royal flush in a poker game. Our difficulties were solved, however, when Glen Dawson spied a lone Indian hiding in the brush. We surrounded him to prevent his escape, and, after quieting his fears in our best jargon of Mexican and English, were directed to the right track across the desert.

Rancho San José is the home of the Melling family, one of the half-dozen Nordic families in the entire region. These families send their children to school in the United States, are delightful hosts, and constitute a sort of Nordic aristocracy in this section of the peninsula.

It seemed to us that we had hardly gone to sleep under the cottonwoods bordering the upper reaches of the Rio San Telmo as it flows through the Melling ranch, when we were awakened by a discordant conversation between birds and burros. Not long afterward we were hiking along the trail to the mountains with our packs where they belonged—on the backs of mules. One day's hike brought us to Vallecitos, the region of little valleys among the pines at the northern end of the San Pedro Martir plateau. A cool stream and rustling pines seemed good after a hot day, hiking through desert chaparral under the glaring Mexican sun. We were close to the Tropic of Cancer, and it was late in June; consequently, at noon we stood in the

middle of our own shadows—interesting, but in the desert not pleasant.

Next day, shouldering our packs, we bade good-by to our mules and our Indian guide. As we left, he muttered (more prophetically than he realized), "*Todos locos! todos locos!*"

How we wished for a good United States Government topographic map as we wandered in a region unknown to all of us, through pine forests and meadows, trying to follow cattle-trails and animal-tracks. However, luck was with us, and long before the sun was low, I recognized the huge boulders of Valle de la Grulla ("Valley of the Crane") where my hunter friends and I had camped on a previous trip. From La Grulla we followed the route shown me by my Indian guide two years ago into Valle Encantada ("Enchanted Valley"). At the head of this five-mile-long valley, in a cañon heaped with boulders, we made our base-camp. A crystal spring of water for drinking, pine needles for a bed, moonlight on the great white boulders, all combined to make this camp like the valley below it, truly *encantada.*

Next day we planned to climb the mountain. Heading due east up the cañon in which lay our camp, then ascending gently rolling fir-timbered slopes, we stood — mountaineers, this time, rather than hunters—on Pico Encantada, the highest point on the main crest of the San Pedro Martir. Here I gazed with admiration on the same view which two years before had inspired this expedition. To the northeast lay the great chasm, known as Cañon Diablo ("Cañon of the Devil"). To the southeast lay the equally deep, but less imposing, Cañon Esperanza ("Cañon of Hope"). At our feet the two cañons joined, forming a notch fifteen hundred feet deep, beyond which rose the steep granite walls of El Picacho itself. This was our route. It looked steep, but we were sure we would be back in camp well before supper-time. A light lunch seemed more than adequate.

The descent of the notch and the climb of the precipitous wall opposite were not particularly difficult. We found to our amazement, however, that what seemed to be a single pyramid was in fact a ridge serrated by five deep clefts. So on we went, contouring on the west side of the pinnacles where possible, but usually finding it necessary to follow the knife-edge up, over, and down. Five times we found it necessary to rope down where the granite cliffs were devoid of holds. The sun was just beginning to set when we completed the passage of the fourth cleft. Our water was low and our lunches reduced to a few

crumbs. Apparently there was no water on the mountain. It was obviously foolhardy to attempt the climb at night, and dangerous to continue it the next day without water. Should we go back while there was still time?

Two thousand feet below us a chimney broadened into a gully before dropping precipitously to the bottom of Cañon Diablo. A council of war brought forth a unanimous decision to try for water in the gully; if we found it, to attempt the summit; if not, to get down the precipice into Cañon Diablo by using, if necessary, all three ropes we were carrying. In the cañon we knew there was water. The Goddess of Luck smiled on us, for in the gully, on the brink of the cañon's cliffs, a reflection of a star enabled us to find a small pool which we might otherwise have passed in the darkness. It was cold on the mountain without bedding or sweaters, but a fire helped, and, although we were ravenously hungry, water and the hope of success on the morrow were some alleviation.

To the top the next day was a scramble of two thousand five hundred feet up cliffs and chimneys of granite. At nine o'clock we were on top. The peak, however, had two summits separated by a cleft. There was nothing to do but climb both peaks, and, finding neither cairn nor record of ascent on either peak, we built the usual rock piles on both.*

The return presented a serious dilemma. If we went back by way of the knife-edge, it meant another night on the mountain without food and water; if we returned to our spring, we would be sure of water, but there would be the chance of having to rope down the precipice into Cañon Diablo. We chose the latter route; the precipice favored us with a brushy chimney, and by mid-afternoon we were enjoying a swim. Here, in a cañon deeper than Yosemite, opening onto a barren desert, we found a stream lined with Woodwardia ferns and scarlet mimulus, while overhead the branches of immense incense

* At the time we felt certain that no one had preceded us on this isolated bit of Lower California. But later we found that Donald McLain, a Los Angeles mapmaker, who was in Lower California alone for seven months in 1911 looking for placer mines, had climbed the mountain. He tells me that in February he left his burro at San Felipe, on the Gulf of California. With a water-bag in his hand, he crossed the desolate distance across the San Felipe desert and climbed out onto the plateau to an Indian settlement somewhere near Socorro. He rested there two days, and, with a supply of "jerkey" and corn-meal, started back the way he had come. From the lower part of Cañon Diablo he followed up the north ridge of the mountain to the top, a less difficult climb than ours. The difficulty of his route lies in getting into the lower part of Cañon Diablo. He had one great advantage—there was snow on the ground. Even at the lower altitudes it was cold. McLain went into the region again in 1914 and 1916, making maps for the United States Army, but did not reclimb the peak.—GLEN DAWSON.

cedars (many of them five feet in diameter) protected this cool stream from the tropical sun.

Nevertheless, our troubles were not yet over. Up the cañon, through thickets and over boulders, to its head, and then out of the notch to the main crest, we finally put four thousand feet of elevation behind us. It was well after dark when, hungry and nearly exhausted, we lay down to spend the night at the first water on the main plateau. The next day, two days overdue, we wandered into camp only to find that Linforth, who had stayed on the plateau to botanize, had left us the following note: "Am going to Mellings for help. Will telephone for an airplane when I reach San Telmo." Fortunately for us, one of the Melling boys was in Valle Encantada at the time. He considered buzzards better than airplanes for locating dead bodies and induced Linforth to wait a while. While Clyde hastened on to overtake our anxious friend, the rest of us had nothing to do but eat, and eat, and eat some more.

THE SUMMIT OF EL PICACHO DEL DIABLO
The highest point is back of the figure
Photograph by Nathan C. Clark

POINT LOBOS
Photograph by Ansel E. Adams

LINES ON POINT LOBOS

BY ROBINSON JEFFERS

Reprinted from "Tamar," by courtesy of the author

. . .

. . . . . do you remember at all
The beauty and strangeness of this
place? Old cypresses
The sailor wind works into deep-sea knots
A thousand years; age-reddened granite
That was the world's cradle and crumbles apieces
Now that we're all grown up, breaks out at the roots;
And underneath it the old gray-granite strength
Is neither glad nor sorry to take the seas
Of all the storms forever and stand as firmly
As when the red hawk wings of the first dawn
Streamed up the sky over it: there is one
more beautiful thing,
Water that owns the north and west and south
And is all colors and never is all quiet,
And the fogs are its breath and float along the
branches of the cypresses.
And I forgot the coals of ruby lichen
That glow in the fog on the old twigs. . . .

THE CYPRESSES OF MONTEREY

By Willis Linn Jepson

TWO rocky headlands, Point Lobos and Cypress Point, one on either side, mark the mouth of the Carmel River, which empties into the Pacific Ocean a few miles south of Monterey Bay. These headlands are small, so small as to border on the insignificant save for this, that each of them bears a narrow forest of a remarkable sort, consisting solely of one kind of Cypress tree, and they have thus become endowed with a unique and singular interest. In the way of botanical observers, the trees were first seen in 1786 by Jean François Galaup de la Pérouse, commander of an ill-fated scientific expedition from France that, two years later, was lost in the South Seas. Since that early day many other expeditions to the Californian coast have come and gone, and we now know definitely, after this long period of searching, that the Monterey Cypress (*Cupressus macrocarpa*) does not occur at any other locality in California—nor elsewhere in the world.

The trees grow on the summits of the headlands and on the very face of the cliffs, always within reach of the flying salt spray from the ocean in times of storm. So exposed are they that the power of the sea may occasionally undermine an individual on the steep face of the rocks, and the tree falls into the thundering gulf below. The Cypress Point grove on the north headland is the larger—a half-mile long, in breadth measuring three hundred yards at its widest. The Point Lobos grove lies on a higher and wilder headland to the south. On both headlands the trees of the cliffs and shore-line carry in their architecture and in their outline, often boldly proclaimed against the sky, the life story of their battle with centuries of storm and wind from the Pacific Ocean—a battle which has recorded in the structural details of the tree's organs the intensity of the struggle to maintain one last foothold on the Californian shore. The thick weave of the clustered masses of foliage, as smooth as a lawn on the seaward side, the long gaunt arms, weirdly irregular and picturesque, the vertical structural bracing of the boardlike trunks and main branches —all these things typify combat, resistance, long-enduring tenacity.

While no two trees of the storm-driven type are alike, all give out so powerful a picture of the dramatic as to make deep appeal to the folk, the lay traveler, the mystically minded. For now three generations a river of people come to see have flowed past the Carmel shores. Frankly exclamatory, or murmuring low one to the other, or querulously skeptical as the eyes turn from the angular type of tree to another, near at hand, which is set in the beauty of its perfect symmetry—all emotions have centered in questionings. Whence came these trees? How is it that they are found only here in California? Why should they have such strange and at times peculiar shapes? In answer to these and many other queries there has grown up a large body of folk legend as odd and as curious as the trees themselves. It is the folk stories that tell us that the Monterey Cypress is the same as the Lebanon Cedar of the Lebanon Mountains in Syria (a statement innocent of the botanical fact that the Lebanon Cedar belongs to the Pine family and that the Monterey Cypress is of the Cypress family); that the tree was brought across the Pacific Ocean from Japan many centuries ago and planted here by Buddhist monks; that it came by the hand of pious pilgrims from the Holy Land as a sign to the devout; and so on in many tones and variations.

Nevertheless, the tree has a real history, the beginnings of which are slowly being unfolded with the results of research on the geological history of the Californian coast and the study of ancient plant migrations. During recent geological periods the eastern part of the North American continent has been relatively stable, but during the same time the coast of California has passed through successive periods of very impressive uplift and correspondingly great subsidence. For a long time it has been a theory of the writer that during the Pleistocene epoch an extensive forest filled the south Coast Range country and extended over the area which at that time united the Santa Barbara Islands with the mainland. The changes which have occurred since, in connection with climatic cycles, are thus made to account for the restriction or localization of many of the forest trees composing that ancient forest.

The Monterey Pine (*Pinus radiata*) occurs in a few small stations along the coast set in the midst of other vegetation—small sharply defined areas in which this species is dominant, and which, hence, are ecologically termed "islands." The Bishop Pine (*Pinus muricata*) is also found only along the seacoast and often in narrow

"islands," especially southward. The Catalina Ironwood (*Lyonothammus floribundus*) is now restricted to three of the islands of the Santa Barbara group. The Torrey Pine (*Pinus torreyana*) is another highly localized species, being limited to a small area on the San Diego coast and to the south end of Santa Rosa Island. The Santa Lucia Fir (*Abies boacteata*) grows only in the Santa Lucia Mountains. The Gowen Cypress (*Cupressus goveniana*) is a dwarf growing in a few tiny areas near Monterey. As our knowledge of past time increases, we are learning that the coastal species of our native trees once had a much greater range. Well-borers on the coastal plain at Los Angeles have brought up fragments of the wood of Redwood, thus extending a long distance southward the present-time range of that species. In the asphalt beds at Carpinteria, Chaney and Mason have recently uncovered cones of the Monterey Pine in excellent preservation, a station far south of the present mainland ranges of that species. Long ago the present writer identified Monterey Pine cones from the strata at Bodega Head and at Mussel Rock, localities north of the present living stations. It is increasingly evident that we are only at the beginning of this unfolding history, and we may confidently say that the Monterey Cypress is a relic of the Pleistocene, a reminder of a silva which has been subject to a long series of migrations following upon the succession of profound geological changes which finally made the Californian coast what it is today. Indeed, the Monterey Cypress, clinging to the edge of the continental shelf, is, as a species, the most dramatic witness of past changes on the western shore-line. It has seen the Santa Lucia Mountains take on their present form, with knife-like cañons cutting direct to the sea; it has seen the Coast Range foothills soften and smooth to their present velvet-flowing slopes; it has seen many forest species migrate from the mountaintops to the shore-line to avoid extinction; it has seen the "Golden Gate," that is the one main outlet to the ocean for waters from the Great Valley, move from Monterey Bay to San Francisco Bay. What a fine pageant has been this! No other tree, from this consideration, is so deserving of the protection which can be afforded by enclosure within the limits of a park sanctuary. Its singular beauty lends to this bit of coast a special charm. No other tree on earth has so narrow a natural range, though its full history, when written, it is not unlikely, will show a range as long as California is long, or possibly much longer. It has

POINT LOBOS
Photograph by Gabriel C. Moulin

A PORTION OF POINT LOBOS—CARMEL BAY AT THE LEFT
Photograph by Ansel E. Adams

today a wider horticultural distribution over the earth than any other Californian tree species; and yet it cannot or does not extend back naturally, that is to say, spontaneously, from the shore-line over land which is now and has been barren of trees. Interesting and pregnant questions multiply constantly about it. All thought, all contemplation, all study are here in a sufficient way eminently worth the mind's attention. It is one tree whose full history will be highly fruitful, and it will in time easily take its place by the side of those trees most well-known of the earth's silva.

A PORTION OF POINT LOBOS—CARMEL BAY AT THE LEFT
Photograph by Ansel E. Adams

THE LITTLE "LOST VALLEY" ON SHEPHERD'S CREST*

By François E. Matthes

LAST summer, while roaming over the High Sierra with the Scout Naturalist Expedition, it was my good fortune to become acquainted with a piece of mountain sculpture of a very exceptional sort. Though presumably not without parallel in the Sierra Nevada, it is nevertheless of a type that from the very nature of things cannot be represented by more than a few rare examples. The feature in question is on the top of the mountain known as Shepherd's Crest, which stands forth prominently on the east side of Virginia Cañon, a mile or more above the McCabe Lakes. To many members of the Sierra Club, doubtless, this mountain is a familiar landmark; for all I know, it has been climbed and explored from end to end; but to me it was new and its summit sculpture a revelation, the more unexpected since the small-scale topographic map, which I had duly scanned in advance, gave scarcely a hint of its unusualness.

Viewed from any low point to the southwest, Shepherd's Crest appears surmounted by a row of blunt pinnacles, all curved in the same direction, and rising from a sheer wall that is cleft at almost regular intervals (Fig. 1). Not having seen the mountain before, one might readily suppose these jagged teeth to constitute the main summit crest; but on viewing it from other directions and from higher vantage-points, one perceives that there is a second crest, higher and smoother, some distance to the north of the first. Between them lies a bit of rolling upland that seems wholly unrelated to the sheer glacier-trimmed sides of the mountain, and, what is most remarkable, this bit of upland consists of a V-shaped valley instead of a convexly moulded summit. From each of the two confining crests the surface slopes inward to an old stream-channel that drains out at the western point of the mountain. This channel is, however, much nearer to the low southern crest than to the high northern crest, which culminates in a summit almost 400 feet above the valley, and so the feature as a whole is strikingly asymmetric.

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* Published by permission of the Director of the U. S. Geological Survey.

The accompanying photographs, taken by members of the Scout Naturalist Expedition, will help to make clear the odd configuration of the little valley. There are added a sketch map and a bird's-eye view designed to bring out its character more completely; these are based merely on the topographic map, the photographs, and my own

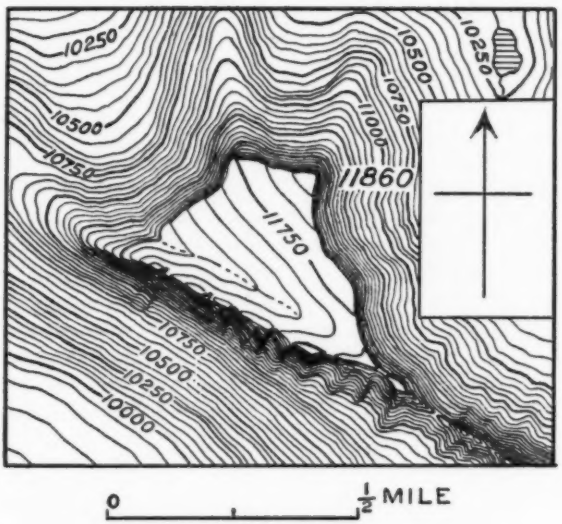

FIGURE 5: SKETCH MAP OF SHEPHERD'S CREST

observations, not on instrumental surveys of any sort. The little upland area, it will be seen, is roughly triangular in outline, and measures three-quarters of a mile in length from northwest to southeast, and one-quarter of a mile in greatest breadth. Its lowest point, at the lip of the valley, is just above the 11,500-foot contour line; the highest point on the northern crest reaches an altitude of 11,860 feet. The floor of Virginia Cañon, near by, is somewhat below 9000 feet.

In the view from Mount Conness (Fig. 2), Shepherd's Crest is discernible in the left middle distance, mainly by the gentle slope that leads up to its high northern crest. The little valley itself is not visible, being masked by the pinnacled southern crest, nor is its actual extent apparent, yet its isolated position amidst the titanic environment of craggy peaks and profound cañons is almost dramatically

revealed. It seems like a little secluded skyland realm, cut off from the fierce world around it by impregnable cliffs.

That this little "lost valley," as the boys called it, is a lone remnant, a surviving bit of an ancient landscape of moderate relief that once had wide extent, but that has been largely consumed by the incision and widening of the deep newer cañons, readily suggests itself to one who observes it critically. Certainly to a geologist trained in the interpretation of topographic forms the fact is at once manifest from the very contrast between the flowing contours of the little upland valley and the stark sculpture of the cañon walls below. Moreover, in the foreground of the view from Mount Conness one beholds the smooth westerly slope of North Peak, which is in the same general range of altitudes as the valley on Shepherd's Crest and represents another remnant of the same ancient landscape. On the west it connects with still other smoothly curving remnants on Sheep Peak (not visible in Fig. 2). To the southeast of Mount Conness, again, one looks down upon a gently sloping tableland that exhibits the same subdued style of topography at the same general level. Farther to the southeast is the long flattish top of White Mountain, and beyond that the nearly level Dana Plateau, the largest tabular summit of this type. To the east and the northeast of Mount Conness, finally, are the smoothly rounded summits of the Tioga Crest, about three miles in aggregate length.

Though these different fragments of the ancient landscape (or erosion surface, as geomorphologists would term it) lie so far apart that the missing portions between them can hardly be reconstructed in imagination, it is possible, nevertheless, to make local restorations and to visualize to some extent the progressive destruction of the old topography by the development of the new. There can be no reasonable doubt, for instance, that the long attenuated arête which ties Shepherd's Crest to the main divide of the Sierra Nevada was once a massive ridge broad enough to bear a strip of the ancient topography throughout its entire length. By the glacial enlargement of the deep cañons on both sides to capacious cirques it has been gradually reduced in width until now there is left only a thin, sharp knife-ridge, a cleaver,* as such a feature would be termed in the Mount Rainier

*Might not the expressive English word *cleaver* be more generally adopted in our vocabulary of mountain terms, in place of the alien and often mispronounced *arête*, thus leading the way, perhaps, to the expulsion of terrible *bergschrunds* and fanciful *roches moutonnées*?—F. E. M.

FIGURE 1: SHEPHERD'S CREST FROM THE SOUTHWEST
Photograph by Robert Branstead

FIGURE 2: LOOKING NORTH FROM MOUNT CONNESS
In the lower part of the view is the nivated west slope of North Peak. A bit of the upland surface on Shepherd's Crest is visible in left middle distance, at the far end of a long arête
Photograph by Richard M. Leonard

FIGURE 3: NORTH PEAK (LEFT) AND MOUNT CONNESS (RIGHT)
From Shepherd's Crest. Upper McCabe Lake below
The nivated slope of North Peak contrasts strikingly with the glacial sculpture roundabout. Its relative antiquity is manifest
Photograph by Richard M. Leonard

FIGURE 4: MOUNT DANA FROM THE DANA PLATEAU
The peak stands 1500 feet above the gently concave surface of the plateau. The ancient landscape of which both are remnants was therefore at least moderately mountainous
Photograph by Robert Branstead

country. By the divergence of the two cirque glaciers Shepherd's Crest and its little upland valley happily were saved from a similar fate, but the broadening of the cirques nevertheless has progressed far enough to destroy in large part the two spurs of the upland topography that originally flanked the little valley. The two crests that now enclose it are not the tops of those ancient spurs—they are merely the sharp edges in which the encroaching cirque walls without cut the gentle slopes of the valley within.

But has not the little valley itself been glaciated? you will ask. No, it exhibits none of the characteristic signs of glaciation—that is,

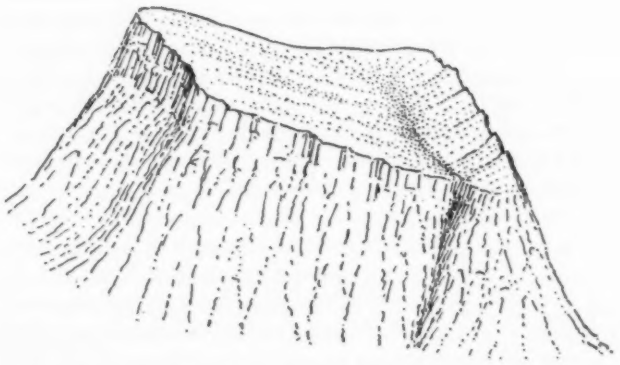

FIGURE 6: BIRD'S-EYE VIEW OF THE LITTLE VALLEY ON SHEPHERD'S CREST

of erosion by a moving ice mass shod with rocks. According to the report of Scoutmaster Richard M. Leonard, who with several of the boys climbed up to the little valley by way of the spur that leads to its lip, polished and striated, or even simply smoothed rock-surfaces and rounded ledges, such as are common features of glacier-beds, are wholly absent from it; neither are there any accumulations of rock débris resembling moraines. On the other hand, he found its slopes encumbered throughout with angular blocks, large and small, loosened and heaved by the freezing of water in joints and crevices; and most of these blocks, he observed, lie on or near their places of origin—no forces other than those of frost, snow-pressure, and gravity, apparently, have acted upon them. Such a mantle of frost-

riven fragments is a characteristic feature of high mountain slopes that have borne no active glaciers, but only inert drifts or fields of snow. It is the product of that slow and unspectacular rock-shattering process due to oft-repeated alternations of frost and thaw, unaccompanied by any adequate transporting agency, for which some years ago I proposed the term *nivation*, in contradistinction to *glaciation*.*

While alternating freezings and thawings occur almost everywhere at high altitudes, the special combination of conditions that results in nivation occurs typically only on high summits and slopes that annually bear snowdrifts for long periods. For both the recurring drifts and the porous rock mantle tend to prevent the melt-water from gathering into vigorous transporting and eroding streams, and instead to distribute it into many feeble rills. Nivated slopes, accordingly, not only are mantled with rock débris that remains *in situ* (except as it is affected by local creeping movements known as "soil flow"),† but they are devoid of sharply cut stream-channels as well.

The little valley on Shepherd's Crest exhibits both of these effects of nivation. Its sides are rock-strewn throughout, and also unfurrowed by stream-worn ravines. Nevertheless, these facts alone cannot be accepted as absolute proof of its non-glaciation, for it is conceivable that the little valley was glaciated at a very early date in the Ice Age—so long ago that the nivation process has since had time to obliterate all traces of ice wear. At least three, and possibly four epochs‡ of glaciation have been recognized in the Sierra Nevada, and the earliest of these occurred presumably not less than half a million years ago. Such a span of time might have been long enough to give the little valley a thoroughly nivated aspect. However, it is to be observed that the valley retains the V-shape characteristic of stream erosion as well as remnants of a stream-channel, now apparently no longer functional, at the bottom of the V. These facts constitute almost irrefutable proof of non-glaciation, for even moderate

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* Matthes, F. E. Glacial sculpture in the Bighorn Mountains, Wyoming: U. S. Geological Survey, 21st Annual Report, part 2, 1900, pp. 167-190.

† Soil flow is relatively rare on the granitic peaks of the Sierra Nevada, but evidences of it were observed last summer on the Dana Plateau. Both nivation and soil flow are common phenomena in Alaska, and they occur on a large scale in northern Greenland, where, in spite of the high latitude, no glaciers have ever existed.

‡ Blackwelder, Eliot. Pleistocene glaciation in the Sierra Nevada and Basin Ranges: Geological Society of America Bull., vol. 42, 1931, pp. 865-922.

Matthes, F. E. Geologic history of the Yosemite Valley: U. S. Geol. Survey Prof. Paper 160, 1930.

glacial action would have sufficed, considering the jointed structure of the granite of Shepherd's Crest, to remodel the valley into a fairly smooth U-shape and to wipe the central stream-channel out of existence; and no amount of nivation would have transformed a glacial U-shape back to a V-shape, or would have produced a new central channel. Its distinct V-shape, therefore, together with its nivated aspect, proves conclusively that the little valley on Shepherd's Crest has remained unglaciated.

Perhaps it will seem as though this conclusion had been reached with needless caution; but it is to be borne in mind that a hollow feature such as a valley is inherently well-adapted for the catchment of large quantities of snow and for the generation of a glacier—much better adapted than a tabular or convex summit. The non-glaciation of the little valley on Shepherd's Crest therefore seemed rather unexpected, and it called for particularly convincing proof.

Such proof having been found, there opens at once a new vista of thought on the subject of the non-glaciation of the high tabular summits of the Sierra Nevada in general. All the tabular summits I have been able to examine bear the earmarks of prolonged nivation, yet corroborative evidence of their non-glaciation is not in every instance afforded by their topography. However, if the valley on Shepherd's Crest has definitely escaped glaciation, then the presumption is all the stronger that these tabular summits—or at least a large proportion of them—have escaped glaciation also.

Now, these summits, mark you, are situated in the highest parts of the range, whence emanated the mighty ice-streams of the glacial epoch—ice-streams that attained lengths of thirty to sixty miles and depths of 2000 to 4000 feet. Shepherd's Crest itself stands between two large cirques that formerly held glaciers a thousand to fifteen hundred feet in thickness, and it fronts on Virginia Cañon, which was the pathway of a trunk glacier fourteen miles in length and 2000 feet in thickness. The unglaciated slope on North Peak (Fig. 3) and the gently sloping platform to the southeast of Mount Conness are both literally surrounded by deep cirques that sent forth good-sized ice-streams. The same is true of the level top of White Mountain, of the Dana Plateau (Fig. 4), of the tabular summits of Mount Gibbs, Kuna, Koip, and Blacktop peaks, and amongst many others farther south, of Mount Darwin and Mount Whitney. How then, it may be asked, does it happen that all these high-level tracts have

escaped the heavy hand of the ice which wrought destruction all around them?

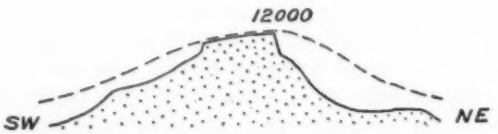
One reason readily suggests itself from the fact that they are all so oriented as to be exposed to the heat of the midday sun as well as to the southwesterly winds—which are the prevailing winds in the High Sierra, as is so eloquently attested by the asymmetric and even recumbent forms of the timber-line trees. Everyone of the tabular summits and slopes before mentioned is inclined to the southwest, the west, or the south. Even the little valley on Shepherd's Crest, although its axis trends northwestward, has in the main southwesterly exposure, for the row of pinnacles on its southern edge is too low to create a "wind shadow" of any consequence. Moreover, any westerly air-currents that enter the little valley at its lip must in part be deflected by the high northern crest so as to turn directly up the valley.

Now, it is a fact of observation that the southwesterly winds blow the bulk of the snow, while it is still in a powdery state, from the exposed slopes up over the mountain crests, and fling it in great banners, as Muir aptly called them, out to the northeast, to let it swirl down at last in the sheltered valleys below. Whatever snowdrifts remain untouched by the wind are later consumed by the rays of the sun, and so toward midsummer all southwesterly and southerly mountain sides are wholly bared, whereas the northeasterly and northerly sides are still generously flecked with snow, and in some places even retain perennial ice bodies.

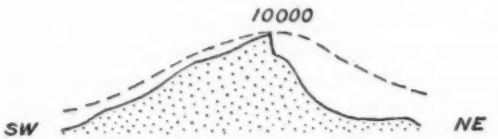
In an article which he published in the SIERRA CLUB BULLETIN, as well as in the *Journal of Geology*, the late Dr. G. K. Gilbert* pointed out that during the Ice Age this markedly unequal distribution of snow, due to the combined action of wind and sun, must have tended to minimize glacial action on the southwesterly and southerly sides of the mountain crests and to intensify it on their northeasterly and northerly sides. As a consequence, many of these crests are now decidedly asymmetric in form, their southwesterly and southerly sides sloping at moderate angles, and their northeasterly and northerly sides being very abrupt, in part composed of unscalable cliffs. Dr. Gilbert saw, furthermore, that this asymmetry becomes more pronounced toward the lower levels of the High Sierra, where the wind-

* Gilbert, G. K. Systematic asymmetry of crest lines in the High Sierra of California: Journal of Geology, vol. xii, no. 7, 1904, pp. 579-588; SIERRA CLUB BULLETIN, vol. v, 1905, pp. 279-286.

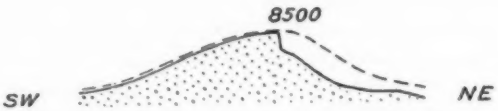
swept and sunny slopes were only feebly glaciated, and that it reaches an optimum at what may be termed the lower limit of glacier generation, where small glaciers could exist only on the sheltered northerly and northeasterly sides of the ridges, and where the southerly and southwesterly slopes remained wholly unglaciated. The contrast there



On extreme summit peaks. Southwest side nivated only
Example, Dana Plateau



Half-way up in High Sierra.
Both sides glaciated, but southwest side only moderately
Example, Mount Hoffmann



At lower level of glacier generation. Southwest side unglaciated
Example, Horse Ridge, near Ostrander Lake

FIGURE 7: PROFILES OF ASYMMETRIC CRESTS IN SIERRA NEVADA

is between the hacked-in headwalls of small cirques, on the one hand, and the gentle contours due to normal weathering and stream erosion, on the other hand. But, curiously, Dr. Gilbert did not complete his analysis. He did not see that the asymmetry of the crests becomes more pronounced also toward the upper levels of the High Sierra, and reaches another optimum on the lofty, tabular summit peaks, where the contrast again is between intense glaciation, on the one hand, and complete non-glaciation, on the other.

Three circumstances account for the non-glaciation of the tabular summit peaks of the Sierra Nevada and the little valley on Shepherd's Crest: First, the southwesterly winds attain much greater velocity and sweeping power at the crest of the range than at lower levels on its west slope; second, because of the cold and the dryness of the air at the higher altitudes, the snow there remains longer in a powdery state and susceptible of being shifted about by the wind; and third, less snow falls in the winter on the main summit peaks than at levels 2000 to 3000 feet lower down. The last statement, it is true, is not supported by actual measurements of snow at different elevations on the west slope, but it may safely be inferred from the fact that the clouds which blow in from the Pacific Ocean discharge the bulk of their snow approximately at the level at which they strike the chilling body of the range—at altitudes between 8000 and 11,000 feet.* Thence upward they inevitably discharge diminishing quantities as they rise toward the summit. In these respects the conditions in the Sierra Nevada are analogous to those that obtain in many other mountain ranges of great height, notably the Swiss Alps, the Pyrenees, the Caucasus, and the Andes of South America. In all these ranges the zone of maximum snow precipitation is known to lie several thousand feet below the summit peaks.

During the more severe climate of the glacial epoch, naturally, the snow-clouds hung even lower on the Sierra Nevada than they do today, and the zone of maximum snow precipitation was correspondingly lower on its west slope. The tabular summit peaks then received proportionately less snow than now, and rose into regions of relative aridity. In that wintry epoch too, no doubt, the southwesterly winds went roaring over the crest of the range with greater fury than at the present time, and so, for both of these reasons, the conditions were peculiarly favorable for the non-glaciation of the higher wind-swept slopes. Paradoxical though it may sound, then, it is because of their great height that the tabular summit peaks and the little valley on Shepherd's Crest have remained unglaciated.

Remains the question: How old is the little valley on Shepherd's Crest? Or, more generally, how old is the "ancient landscape" of which it and the numerous tabular summit-tracts in the High Sierra are the remnants? Is it possible to determine its age in any way?

* These figures are for the latitude of the Yosemite region. They are rough approximations. More accurate data are desired.

Yes, it is possible, though only roughly and by roundabout methods.

It will be remembered that the Sierra Nevada consists essentially of a vast block of the earth's crust that lies tilted to the southwest, so that its eastern edge forms the crest line and its western edge lies deeply buried beneath the sediments in the great valley of California. This great earth-block gained its tilted attitude not at one bound but by successive hoists separated by long intervals of relative stability—intervals to be reckoned in millions of years. With each uplift the streams coursing down its west slope were tremendously accelerated and intrenched themselves in narrow steep-sided cañons. During each interval of repose their downward cutting slackened, the cañons widened out to valleys by the weathering and erosion of their sides, the tributary streams cut ramifying valleys, and there was developed a landscape or "erosion surface" with a topography of its own. Naturally the cañons and valleys of each new cycle of stream activity were cut into the topographic forms left by the preceding cycle, and so each new landscape was developed at the expense of the previous one.

On the west slope of the Sierra Nevada there can be distinguished four sets of topographic forms recording the work of as many cycles of stream erosion. The newest forms are the narrow V-shaped cañons in which the main streams now flow. They were carved in consequence of the last uptilting of the Sierra Block, which occurred probably early in the Pleistocene epoch. Less than a million years old, they are still being actively deepened by the streams and remain youthful in aspect.

To a close observer it is patent that these Pleistocene cañons were cut into the broad floors of mature valleys of an earlier cycle. The Big Meadow flat, which lies more than 2000 feet above the Merced River at El Portal, is a remnant of such an older valley. The gently sloping platform about Turtleback Dome, over which the new highway to the Yosemite Valley is laid, is another remnant, and so is the entire Illilouette Valley, which has never been trenched. Examples are plentiful also along the other cañons of the Sierra Nevada, notably along those of the Stanislaus and San Joaquin. These older valleys, which attain great breadth on the lower slope of the range, are the products of a much longer cycle of erosion—a cycle that comprised probably all of the Pliocene epoch and lasted more than 7,000,000 years.

SEQUENCE OF MOUNTAIN BUILDING AND EROSIONAL EVENTS IN SIERRA REGION
(Read item for item from bottom up)

ERA	PERIOD	EPOCH	NATURE OF EVENTS	DURATION IN YEARS*
Cenozoic	Quaternary	Recent	Post-glacial time. Cañon-cutting continues.	20,000
		Pleistocene (Ice Age)	Higher parts of Sierra Nevada are repeatedly glaciated. The last and greatest tilting movement. New cañons are cut in bottoms of Pliocene valleys.	1,000,000
	Tertiary	Pliocene	Period of stability. The cañons are deepened and widen gradually into valleys.	7,000,000
		Miocene	Master streams begin to cut cañons into Miocene erosion surface. Strong tilting of Sierra block. Andesitic eruptions in north half. Gradual development of a mature landscape. Isolated remnants of the early Eocene landscape remain preserved on residual peaks.	12,000,000
		Oligocene	Continued upwarping and widespread stream erosion.	16,000,000
		(late) (middle) Eocene (early)	Rhyolitic eruptions bury stream-channels in north half of range. Master streams intrench themselves below general level of early Eocene landscape. Axis of Sierra region rises several thousand feet in height. Development of a mature landscape, moderately mountainous in its higher parts — the landscape of which the little valley on Shepherd's Crest and the tabular summits of the High Sierra are remnants.	23,000,000
Mesozoic	Cretaceous		Prolonged erosion. The late Jurassic mountains are worn down by degrees, and the granite becomes exposed over large areas.	75,000,000
	Jurassic		Uplift and folding of the strata. A system of northwestward trending ridges is produced. The granite wells up in a fluid state underneath. Deposition continues.	40,000,000
	Triassic		Sediments are deposited in successive strata in a shallow sea at western border of continent.	40,000,000
Paleozoic			Earlier geologic history.	415,000,000
Proterozoic				1,000,000,000+

*After Barrell

Big Meadow, Turtleback Dome, and the Illilouette Valley in their turn lie 2000 to 2500 feet below the general level of the little valleys on the uplands that flank the Yosemite. These billowy uplands are, indeed, portions of a still earlier landscape—a landscape that was produced during a very long cycle of erosion comprising most of the Miocene epoch and probably large parts of the preceding Oligocene epoch. Its age cannot be determined in the Yosemite region for want of telltale fossils, but it is indicated as probably late Miocene by fossils found near the old mining town of Columbia, north of the Tuolumne Table Mountain.

High above the Miocene landscape, which remains preserved on many of the extensive intercañon tracts, stand the peaks and ranges that give the High Sierra its alpine character; and it is on some of the loftiest of these peaks and ranges, 2000 to 3000 feet above the Miocene hills, that are found the gently sloping, tabular remnants of the ancient landscape to which the little valley on Shepherd's Crest belongs. The age of this landscape is indicated approximately by the fact that in the northern parts of the Sierra Nevada remnants of it lie 1000 to nearly 2000 feet above the "fossil stream-beds" that contain the earlier gold-bearing gravel. These stream-beds, which were preserved by masses of indurated volcanic ash (rhyolitic tuff), have yielded fossil plant remains of middle Eocene age. It follows that the ancient landscape in question goes back at least to early Eocene, possibly, even, to late Cretaceous time. If it is, conservatively, assigned an early Eocene age, then, as will appear from the geologic table, it cannot be less than 50,000,000 years old.

That any parts of a landscape so ancient could remain preserved on exposed mountaintops may at first seem incredible. Yet in the Sierra Nevada the fact is hardly open to doubt. Three circumstances, it would appear, have operated to preserve those bits of the early Eocene landscape that form the tabular summits of the highest peaks —namely, the resistant nature of the granitic rocks of which those peaks are made; the position of those peaks at the extreme heads of the rivers, where the streams are smallest and have the least cutting power; and their complete exemption from glacial erosion. Of course, it is not contended that these residual summit tracts have suffered no degradation whatever since early Eocene time; but the fact is stressed that they have suffered but very little change as compared with the deep cañons that surround them—so little, that they

retain the gentle slopes and rounded contours that were imparted to them when the Sierra region still was a land of moderate elevation.

Of all the ancient summit-tracts in the High Sierra, certainly the little valley on Shepherd's Crest seems most remarkable; for a valley, being the pathway of a stream, is inherently more likely to be cut away during the uplift of a mountain range than is a ridge or a summit. Only some special circumstance could have saved it. Perhaps the streamlet on Shepherd's Crest was unable to compete with its neighbors because its water was entrapped by vertical fissures that developed across its path—the same fissures that separate the pinnacles of the south crest from one another. Again, the little valley seems remarkable because it has escaped glaciation, although valleys inherently afford good sites for glaciers. And, finally, to a student of the High Sierra it seems particularly precious because its non-glaciation, so well attested by its form, confirms the non-glaciation of many of the lofty tabular summits of the Sierra Nevada.

THE SECOND ASCENT OF MOUNT McKINLEY

By Harry J. Liek,

SUPERINTENDENT OF MOUNT McKINLEY NATIONAL PARK, ALASKA

MOUNT McKINLEY, in the interior of Alaska, stands 20,300 feet above the level of the sea, and is the highest peak in North America. Although not reaching the altitude of many of the peaks of the Himalayas and of several in the Andes, it is said to stand higher from its immediate base than any other peak in the world. Mount McKinley was practically unknown until 1897, when W. A. Dickey described in a New York newspaper his view of the mountain the preceding summer. It was Dickey who gave the name by which it is now universally called. It is said that he chose the name as a protest against the arguments of some "free-silver" miners. At all events, the name became fixed, and efforts to revive the Indian name ("Denali") appear fruitless.

The first attempts to climb the mountain were made in 1903—one by Judge James Wickersham, another by Dr. Frederick A. Cook and party; neither came anywhere near the summit, although the explorations were very finely carried out. In 1906 Dr. Cook approached the mountain again, accompanied by Professor Herschel C. Parker and Belmore Browne. This turned out to be another exploring expedition, so far as Parker and Browne were concerned. But Dr. Cook stayed behind, with one companion, after the others had left, and appeared a few weeks later with the story that he had climbed Mount McKinley. He wrote a book about it, and many people believed him. Parker and Browne were always skeptical, and later proved Cook's story to be false. No one with any knowledge of the mountain could ever believe that Cook reached the summit.

The first climb that could be called in any way successful was made in 1910. Four experienced Alaska mining men set out from Fairbanks for the Muldrow Glacier, which they believed was the key to the ascent. They were right, and to Thomas Lloyd, William R. Taylor, Peter Anderson, and Charles McGonagall belongs the credit for discovering the only practicable approach. McGonagall discovered the pass by which the glacier is reached, and his name is

now firmly affixed to it. The party camped high up on the glacier, and Anderson and Taylor carried a flagstaff to the last rocks on the North Peak, which is slightly lower than the South Peak. This was the first real conquest of the mountain. Parker and Browne tried again in 1912, and this time, following the Muldrow Glacier route, practically succeeded in reaching the top of the South Peak, although they were driven off the summit by a blizzard just before attaining the highest point; so, technically, they did not make a complete ascent. Three were in the party: Herschel C. Parker, Belmore Browne, and Merl LaVoy. The first complete ascent of Mount McKinley was made on June 7, 1913, when Henry P. Karstens, later my predecessor as superintendent of the park, Rev. Hudson Stuck, an Episcopalian missionary, Robert G. Tatum, now an Episcopalian minister in Knoxville, Tennessee, and Walter Harper, a native of Alaska, stood on the very highest point on a clear, cold day.

For nineteen years after the Karstens-Stuck expedition, no attempt was made to climb the mountain. Meanwhile the national park had been established by act of Congress in 1917, and much had been learned about the character of the country around the peak. Airplanes had been flown around the mountain and over its summit. In 1931, Albert D. Lindley, a lawyer from Minneapolis, made one of these flights and had become enthusiastic about attempting an ascent. Ever since coming to the park in 1928, I had had it in my mind to try the climb, but until Lindley appeared I could not find anyone ready to try it with me. We agreed to join forces for the climb the following spring. Lindley spent the fall and winter getting together the equipment, while I made the necessary preparations in the park. He arrived the end of March, bringing with him Erling Strom, of Lake Placid, N. Y., an expert on skis. I had already sent Park Ranger Grant H. Pearson ahead to the base-camp with a dog-team load of provisions. We left park headquarters on April 4, 1932, with another dog-team, and in four days arrived at base-camp on Cache Creek, about seven miles from McGonagall Pass. Here Chief Ranger Louis Corbley, who had been taking in a load for another party, assisted us in moving to Camp No. 1, on Muldrow Glacier. This other party, under the leadership of Allen Carpé, was expected to arrive in a few days for the purpose of making observations at altitudes in connection with investigations of the cosmic ray. We established another camp below what is known as the Big Serac; then, in three days of freighting,

MOUNT McKINLEY
Photograph furnished by courtesy of the United States National Park Service

MOUNT McKINLEY
Photograph furnished by courtesy of the United States National Park Service

ON MULDROW GLACIER, BETWEEN CAMPS I AND II

LOOKING UP MULDROW GLACIER FROM McGONAGALL PASS
Photographs by the Lindley-Liek Expedition

moved to the third camp, almost at the foot of the ice-fall at 11,000 feet. Here the dog-teams turned back, and we four were left alone.

From then on, it was a proposition of back-packing up Karstens Ridge to another camp, at 12,200 feet. The ascent of Karstens Ridge was one of the most difficult parts of the climb. The ridge was so steep and the cone was so sharp that it resembled the peak of a pitched roof. On the one side the ridge fell sharply to the ice two thousand feet below; on the other side was a drop of between three and four thousand feet. Ice-steps had to be cut all the way along. At one point the ridge was so steep that we made a traverse to the right along the side, cutting steps all the way. We worked our way above the ice-fall by putting in switchbacks until we came to what we called the "Dome," just below Browne's Tower. It was a big round dome, and in getting up it we had just about the steepest part of our climb; but there was no sharp ridge with which to contend. From a rock at the bottom to the top of the Dome we cut eight hundred ice-steps. That may seem like a lot, but we had to cut thousands coming up the ridge. At one place we had to go around a point hanging over space. We fastened one end of a rope to a rock and hung a heavy sack of ice to the other, using the rope to steady ourselves. The view of blank space below while crossing the ice-shelf wasn't exactly a comfortable sight. Incidentally, I might say we roped ourselves together only once on the entire trip, and that was when we were coming down Muldrow Glacier. Once we were on top of the ice-fall, it was fairly easy going for a time. There were no steps to cut.

Not one trip, but several, had to be made up Karstens Ridge and the Dome. Our equipment had to be relayed. Each man carried fifty to sixty pounds at a trip; but even then it required several relays. When we had reached 15,000 feet we estimated that in distance covered we had climbed the mountain four or five times. We noticed the altitude constantly, under any conditions, from 15,000 feet on up, and it made itself felt at lower levels when we were carrying heavy loads. We would travel from ten to thirty steps, and then stop to "pump ourselves up" before continuing. The process resembled nothing so much as air being forced into an automobile tire.

At Browne's Tower, at 15,000 altitude, we found the thermometer left by the Stuck and Karstens party nineteen years before. It was in a wind-swept place, free from snow. We photographed it in place and then removed the instrument from the wooden case. Many

guesses were made as to the minimum temperature which would be registered, guesses ranging from 60 to 80 degrees below zero. None of them was right, and no man will ever know how cold it was; the indicator was as far down in the bulb as it would go. The minimum reading on the thermometer was 95 degrees below zero. The actual minimum temperature was somewhere below that point, how far it is difficult to say. But the indicator's position led us to believe that it was at least 100 degrees below zero. The instrument was subsequently checked and found to be accurate.

The next move was to relay our stuff to the last camp before the final climb, 17,000 feet up on Harper Glacier. We were about four days moving everything up. The effects of the altitude began to be felt more plainly. For instance, one would be eating in the tent and would reach for something across the "table." The casual effort would leave one panting and exhausted. Even such a simple exertion as turning over in bed had that effect. Several times when I did so I had the sensation of smothering, and would have to sit bolt upright to regain my breath.

The morning of May 7th dawned clear and beautiful. In a twelve-hour climb we reached the south (or higher) peak. We carried only cameras and compact rations, such as chocolate, raisins, and a special hardtack. The climbing was pretty stiff. It was possible to take only twenty-five or thirty steps before resting. The character of the terrain was varying. Sometimes walking would be comparatively easy for a short stretch and then the mountain would become very steep again.

It was between five and six o'clock in the afternoon of Saturday, May 7th, when finally we stood on the highest point of the North American Continent. Words cannot express the feeling that was ours or the sight which met our eyes. The vast and rugged chain of the Alaska Range was encompassed within our view. There was a smudge of smoke which we took to be either Nenana or Fairbanks. A haze hid Anchorage and Cook Inlet, but we could see for a hundred miles in that direction. There was not a cloud in the sky; all was bathed in sunlight. A stiff wind was blowing and it was extremely cold, and, although we had no thermometer to give us the true temperature, it must have been 30 below. In our efforts to take pictures our hands became numb, and we had a great deal of trouble with the cameras. We found subsequently that all the cameras had frozen, and we did not get a single picture of the summit.

We stayed on the peak between half and three-quarters of an hour, despite the cold. On the very top we left a camera tripod. By the time we got through, those of us who hadn't already had our feet frosted had our fingers nipped. From the peak it was easy to see why attempts to climb the mountain from the south side had failed. There is an almost sheer wall on that side, of from seven to eight thousand feet. The east side also is very rugged.

Soon after starting down, we came to the highest rocks on the north side of the South Peak, where Parker and Browne left a thermometer in 1912. A good deal of time was spent in hunting for the instrument; but we didn't have shovels, and with our ice-axes it was impossible to dig it out of the snow. We were getting cold and had to quit. We had a waterproof cylinder in which we placed a scroll with our names and a description of the trip. The tube was placed on a rock and secured there. The spot was one where the wind would keep it free from snow. Any future party cannot help but find it.

While we were busy with the tube, Pearson, who had started on down ahead of us, caught his crampon in his pants-leg and tripped himself. He slid for three or four hundred yards before loose snow stopped his precipitous descent. He was unhurt by the fall, but suffered the loss of his ice-axe, pack, mittens, and cap. Before he could get his ears covered they were frozen.

The return trip to the high camp was made that night without mishap. We were all in, and so tired we went to bed without eating. Three small gas-stoves were used for heating the tents; but even with them in operation it often became desperately cold. When we went to bed we put on all our clothing, parkas, mittens, and caps, and crawled into our eiderdown sleeping-robes. Even then we were generally awakened several times during the night by the cold. Suffering would have been much more intense had it not been for the stoves. The next day, Sunday, May 8th, we rested. It was another beautiful day, but we were in no condition for climbing. After eating we sat around, too tired to talk.

May 9th proved to be another fine day. We had regained our strength, and at an early hour started the ascent of the North Peak. Our pathway lay up a glacier, and the going was very hard. Our route was on the west side, and we could look directly down on Mount Foraker. After the glacier had been conquered we had to go up a big rock cliff. It took a long time to do so, and once up we were to the

north of the North Peak. We dropped down into a slight basin before starting the real ascent of the peak. Its face was very abrupt and climbing was tortuous. But hard work finally won out, and we stood at a point second in height on this continent to McKinley's other peak. The climb had taken twelve hours, as had the ascent of the South Peak. The sun was shining brilliantly, and again we were treated to a grand view. The South Peak lay about four miles away.

We had been on the peak about three-quarters of an hour when the clouds shut out the view and a storm began to envelop us. But we had taken pictures and had accomplished our work. We had climbed both peaks of Mount McKinley, the first party to do so, and it was with a feeling of satisfaction and triumph that we started down.

We slept late the next morning, and awakened to find the tents filled with snow. Breakfast over, we stayed inside in the hope that the storm would blow itself out. By noon it had moderated slightly, and, anxious to leave, we made our preparations. One tent was pulled down, to be taken with us. All but our personal effects were piled in the other and left right there. Traveling was fairly fast on the first part of the trip down. At the second camp on Harper Glacier we picked up food and other supplies left there and dropped on down to the camp at 15,000 feet, ahead of which lay Karstens Ridge. On our arrival there we found that storms had completely wiped out the trail we had made coming up. That meant it would be necessary to cut new ice-steps all the way down.

The storm was still in progress when we hit the Dome, but rather than backtrack to the 15,000-foot level and establish a camp we decided to keep on going. We traveled all night. One man would take off his pack, cut fifty steps and then go back for his pack, when the man behind would go through the same process. It was about two o'clock in the morning when we got to the 12,000-foot camp. We stopped there, set up a stove and made bouillon, the first liquid we had taken since the previous morning. Refreshed by the nourishment, we kept on cutting steps until we had arrived at the 11,000-foot level at six A.M.

And here we came upon the first evidences of a tragedy which abruptly ended our feelings of elation over our success. For here we found the deserted camp of Allen Carpé and Theodore Koven, advance members of the cosmic ray party. Yet, at first, we did not realize the full significance of what we saw. We thought that the two

KARSTENS RIDGE

Photographs by the Lindley-Bell Expedition

CAMP III AT ELEVEN THOUSAND FEET

KARSTENS RIDGE

CAMP III AT ELEVEN THOUSAND FEET

Photographs by the Lindley-Eick Expedition

THE CLIMBERS OF MOUNT MCKINLEY, 1932
Albert D. Lindley Harry J. Liek Grant H. Pearson Erling Strom

CAMP ON KARSTENS RIDGE
Photographs by the Lindley-Liek Expedition

had perhaps gone down the glacier to meet their companions, although we were puzzled by the way in which the camp had been left. We set up our own camp and had breakfast, for it was almost twenty-four hours since we had eaten. After another search of the neighborhood for the missing men, we started down the glacier. For two miles it was fairly good going; then we began to strike crevasses. Suddenly we came upon Koven's body lying in the snow on top of a high serac. The shock was great. We had not expected anything like that and were tremendously upset. The body was lying in the snow face down. Lindley knew Carpé, and when we rolled the body over we realized it must be Koven. Soon we found papers in the pockets positively identifying him. We then started looking for Carpé, and saw where he had fallen into a crevasse, a large one. We could not see his body, but signs near the edge clearly indicated he had met with disaster.*

The rest of the story is a sad one: of the vain attempt to find Carpé's body, of examining the evidences of the tragedy, and of the effort to bring down Koven's body, abandoned because of the dangerous condition of the glacier. Pearson had a narrow escape from death in a crevasse. At four o'clock the following morning we reached the camp of the other members of the cosmic ray party and broke the news to them. As the most important thing for us to do was to get out to lines of communication, we did not linger long, but continued on, reaching the base-camp at Cache Creek about five o'clock on the morning of the 12th.

It had been forty hours from the time we started from the 17,000-foot elevation until we landed at the base-camp. We had had only one meal during that time. We had a big feed and then went to bed, sleeping until evening. Then we ate heartily and went right to bed again. The next morning we started for headquarters, and our three-days' journey there was uneventful.

*Theodore Koven, of Jersey City, New Jersey, 28 years old, was a member of the Sierra Club. Allen Carpé, of New York, 37 years old, was one of the most experienced and ablest of American mountaineers. A brief account of the disaster is given in *American Alpine Journal*, 1932, 1:4, pp. 511-514.

THREE THOUSAND MILES UP THE AMAZON

By Ynes Mexia

MOST of us, I think, have felt the fascination of the Amazon region. So much have we heard of its rivers, its tropical beauty, its luxuriant forests, the wild life and wilder Indians that lurk in its depths, that the pictures drawn by our imagination are vivid and unique. This vision of the unspoiled wilderness drew me irresistibly, and from this tale of how I went and what I found you shall judge what there is of fact and what of fiction in the old stories.

With some letters of introduction, a knowledge of Spanish, and a quantity of botanical-collecting equipment, I left San Francisco in October, 1929, taking a steamer that went through the Canal and landed me in Rio de Janeiro. From there I went to the highlands of Brazil, in the State of Minas Geraes, and collected at various points there for a year and a half. Returning to Rio, I decided that if I wanted to become better acquainted with the South American Continent the best way would be to make my way right across it. Inquiry developed the fact that it was possible to cross the Andes from the west coast and then come down the Amazon River. But I was already on the east coast, so why not from east to west? No one had ever heard of its being done, so they did not know. Also, I heard about the Pongo de Manseriche, the Iron Gate of the Upper Amazon, which few had seen, but reputed to be magnificent. Well—why not?

A comfortable motorship took me up the Brazilian coast to Pará, at the mouth of the Amazon, where the staff of the Goeldi Museum did much to assist me in my preparations. On August 28, 1931, with a truckload of equipment, I boarded the river-steamer "Victoria" and started up the famous river. Surely there was no roughing it on the steamer. Screened cabins, electric fans, ice plant aboard, as well as fresh meat "on the hoof."

The river itself is a tawny flood, looking more like an inland sea, "El Rio Mar de las Amazonas," than a river. Everywhere it is island-sown, and these islands divide it into *paranás,* or channels, each of which may be several miles wide. Vessels ascending the river follow these side channels, often bringing the boat sufficiently

close to island-shore or mainland to enable one to see many interesting features. Every foot of *terra firma* is heavily wooded, and these forests of the Lower Amazon are truly magnificent. From the center of a channel they may look like a heavy dark line on the otherwise watery horizon; but when approached they take on the appearance of tall walls of living green—crowded, impenetrable, composed of innumerable varieties of ever-verdant trees, among which are conspicuous many species of graceful palms towering above the green canopy.

Our steamer was a wood-burner, so daily it would tie up at some tiny clearing in the otherwise unbroken forest where huge piles of cordwood awaited us, and where bronzed half-naked *caboclos* (Indian or negro half-breeds) toiled like demons to fill the capacious maw of the "Victoria." These stops gave me a chance to go ashore, where a few airy thatched houses, a dozen or so inhabitants, some chickens and pigs constituted the settlement. Everywhere the forest crowded the scanty clearings, hemming them in darkly.

The sixth day up the river brought us to the town of Óbydos, perched on low pink cliffs, a rare sight in this flattest of alluvial basins, and remarkable as one of only two points where both banks of the Amazon can be seen without intervening islands.

After leaving Óbydos the wild life became more abundant. Huge *jacarés*, or caimans, slid off sand-banks as we chugged along. Numbers of the beautiful white aigret herons were outlined against the green of the forest bank, while flocks of chattering parrakeets flashed green and silver as they wheeled above the river. Everywhere are seen the dugout canoes, some holding half a dozen persons and carrying produce, and others, mere shells, with a single paddler. The latter, in this country, where the water-path takes the place of the trail, are significantly called *monterias*, or "mounts." Most numerous, of course, are the canoes around the little clearings, where the dwellers run out eagerly to watch the "Victoria" pass—a man or two, half a dozen ragged children, the chocolate-colored naked babies, and, in the background, the thatched house built on stilts as a precaution against the floods.

Eight days up the river the map shows a "Santa Julia." It consisted of two forlorn-looking shacks standing apart. From the farther one issued an official. He entered a canoe displaying the yellow-and-green Brazilian flag, and accosted the "Victoria." When

he came aboard I discovered that we were just entering the vast State of Amazonas, and needed his official permission. After another day or two, we arrived at Manaos, on the Rio Negro, just above its junction with the Amazon. It is the capital of the huge and little-explored State of Amazonas. Certainly a surprise, for this city, in the heart of what is generally considered a howling wilderness, is a very modern place, with wide, tree-shaded streets, electric trams, hospitals, splendid public buildings, and a beautiful opera-house of Italian marble topped with a gold-tiled dome.

Four days at Manaos, and we were on our way. The vast river, however, is of many moods and has many names, here being known as the "Solimoes," from a now vanished tribe of Indians which once lived along its banks. The river's course lies but a degree or two south of the equator, and I had dreaded the heat, only to be agreeably surprised as to the temperature. It is hot at times, but nothing like the heat found in our own Southwest, for example. Sunstroke is unknown, for the moisture in the air is so great that the sky is generally cloudy, while the daily afternoon thunderstorms cool the air appreciably. Great was my amusement, after one of these showers, to see the ship's pilot emerge from his cabin in overcoat and muffler!

The ever-present forest changes somewhat as we progress. Palms, while present, are no longer a dominant note. The "Imbaubas" (*Cecropia,* sp.) take their place, with their slender white trunks and enormous leaves, so down-covered that they gleam silver-white under shining sun or tropic moon. The forest trees in this section are so covered with vines and *lianas* that they look like verdant columns or queer un-tree-like geometrical forms, while perhaps a two-hundred-foot "Ceiba Pentandra," or silk-cottonwood tree, spreads a perfect dome above the forest roof.

The "Victoria" is a fine vehicle from which to become acquainted with the country, or, I should say, with the river (for the land in this region is but a varying combination of silt and water), as she is always stopping for some interesting performance. She sidles up to the bank covered with ten-foot *capim,* or tall grass, and the crew go ashore to cut fodder for our hungry beeves. I jump into boots and khaki (much to the amusement of the passengers) and walk the plank to investigate the forest.

Beautiful as is the forest seen from the river, it is repelling to enter.

The canopy is so dense that it cuts off all sunlight, prohibiting undergrowth. There are no trails; it is dark and dank, with crowding tree-trunks, tangling *lianas,* rotting logs everywhere, and oozy, treacherous soil. No flowers are to be seen; such trees as are in bloom keep their color and fragrance for the forest roof where the real life of the forest displays itself.

Again the boat stops, the men drop into a canoe, paddle to a cove, casually cast a net, and back they come with the dugout piled high with gleaming, silvery fish, which we find very good eating at dinner-time. Like the exuberant growth above ground, the *café-au-lait* waters of the Amazon are seething with the life hidden in its opaque depths; but of this we catch the merest glimpse. Most conspicuous of the water-dwellers are the "Bôto Preto" and the "Bôto Vermelho," the black and red porpoises, known only in this great fresh-water system. They leap and play as do their cousins of the salt water.

Time seems to have no meaning in this world of sky and water; but after twenty-two days of river life we reach the Rio Javary coming up from the south, which marks the boundary between Brazil and Peru. The hamlet of Tabatinga shows but a tiny guard-house, a few lounging soldiers, and an old bronze cannon, to which the "Victoria" tied fast. Crossing the Javary we entered the territory of Peru, the guard-house here consisting of a thatched hut in the jungle. But on the northern shore there is a little cluster of huts until lately in Peruvian territory. Old boundary treaties were vague; this pathless wilderness never knew surveyor, and Peru, Colombia, and Brazil each claimed this hitherto unwanted jungle. It was awarded to Colombia by an International Boundary Commission, to give an outlet through the Amazon and to the Atlantic. Thus, in this obscure corner of the wilderness the three great countries meet—Brazil, Peru, and Colombia, with Ecuador clamoring for entrance—and this junction is fraught with danger.

At Chimbote, our first station in Peru, our wood was loaded by the Iahuas Indians in native costume, consisting of a full short skirt of split palm-leaves, cape, armlets and anklets of the same, dyed an orange-red that shaded into their smooth brown skins. Rather stunning they were, and quite willing to pose for their pictures in exchange for a few crackers.

On the twenty-fourth day we approached Iquitos in Transandean Peru, and my long, lazy, delightful voyage of 2500 miles on the

"Victoria" was over. Iquitos is quite a lively town, sitting like a spider in the center of its web, whose silken strands are the shining rivers which come from north, west, and south, traversing this wilderness. The *lanchas,* or river boats, which ascend these rivers and their affluents, carry simple necessities to exchange for skins of beast, bird, and snake, for rubber and mahogany, for vegetable ivory, and for monkeys and parrots.

Here, repacking my equipment, I laid in three-months' supplies, and hiring three men, I embarked on one of those *lanchas,* which wandered up the much-named river (now the Marañon) for another week, until we reached Barranca, where the "expedition" was dumped ashore. The "Alberto" whistled thrice, turned, and slid down the river.

José, the guide-hunter, with some difficulty hired a large dug-out canoe, with four Indian paddlers, which would carry half the baggage. He was to follow with the rest as soon as he could secure another canoe. With me, in this first canoe, went my two *cholos,* or civilized Indians—and fine fellows they turned out to be. I gave the word, the men dug in their paddles, and we were off on the last leg of the journey west to the famous Pongo de Manseriche.

If the voyage on the steamer was full of interest, that in the canoe was enthralling. We crept along the river-bank, often under the overhanging trees to avoid the current, the men poling in the shallows along the generous curves of the meandering stream, or bending to the paddles as they stemmed the swifter current. I sat amidships under a little palm-leaf shelter, forgetting my rather hard "box-seat" in watching the river and its life as it unfolded before me.

The second day out we passed the last hut in its tiny clearing. We took on huge bunches of green plantains and a supply of the sweet manioc roots for food. From there on there was no sight of human beings—only the shining, shimmering, cream-brown river, stretching from sunrise to sunset, confined by living green walls on the right and on the left, and above all the high-arched sky, delicately clouded at dawn, its intense blue relieved as the sun rose higher by fleecy white clouds, which soon piled aloft in huge cumuli, and turning black and threatening as they tore down upon us in a torrent of blinding rain, with thunder and lightning, for the afternoon storm. The deluge lessened, passed us by, traveling Andes-ward, and left us crawling in its wake refreshed and enlivened under a cloudless sky until we headed into the burning heart of a tropical sunset.

And, as dusk came swiftly, we would search out a sandy beach, often tracked by jaguar and tapir, and camp for the night. Valentino would deftly light the fire and have his pots simmering in no time. I would roam around watching the bird life and the vegetation. Neptalí would put up my cot and mosquito-net, spread large musa-leaves for a rug, bring water for my bath—for no one dare bathe in the Father of Waters; his spawn are too voracious. Up at dawn, and another day of inching the heavy canoe past monstrous stranded trees, battling the current, or poling cheerfully in a world of naught but river and forest and sky; at last the long-desired wilderness, untouched and unmarred by the hand of man. Then one day, as we started ever westward, a blue mist hung low on the horizon athwart our river highway, which, unlike other morning mists, did not dissipate with the rising sun, but took on a dim outline and a deeper blue until it dawned upon us that it was no mist, but the eastern-flung chain of the mighty Andes, the barrier that would end our journey.

Day by day the blue outline rose higher and grew clearer, the seemingly impassable barrier of the Sierra del Pongo. On the ninth day it towered above us, densely tree-clad. As we reached its foot, we found ourselves surrounded by the Aguaruna Indians, who live in this region. Our first reception was rather dubious, for copper-headed spears and twelve-foot blow-guns with their tiny darts were much in evidence. The Aguarunas had long since spied our large canoe ascending the river, and were prepared to meet the Wambisas, a tribe of their blood enemies, who live on the Rio Morona below them. When they found we were "Christianos" instead of the dreaded Wambisas, they were greatly relieved and received us with rejoicing. I had come prepared, and solemnly presented each woman with a needle and each man with a small fish-hook as good-will gifts. The Indians took us to their *moluca,* or thatched communal house, and were delighted to have their pictures taken. The men wear a sort of skirt made from the wild cotton which they spin and weave, or, lacking this, they use a fibrous bark beaten thin. The women have a kind of garment tied over one shoulder. The boys go naked. The roar of the waters came to our ears, the clouds hung low over the blocked iron gateway of the Amazon, and the end of the water-trail was near.

The Marañon has its source some 170 miles north of Lima and but a hundred miles or so from the Pacific. It flows northwest for

hundreds of miles, cutting deep cañons between the Cordillera Occidental and the Cordillera Central of the Andes, then, turning abruptly eastward, it escapes from the central chain and cuts through the Cordillera Oriental by a *pongo,* or gorge, here named from the Manserisse Indians, who inhabited this region at the coming of the Spaniards.

The nearly perpendicular walls of the Pongo are estimated to be about 600 meters high. The Sierra del Pongo is composed of hard sandstone and limestone from which ammonites and cycads have been recovered. It is buckled into an anticline through which the river cuts at right angles. The length is only some seven miles; but when a river normally from one to several miles broad tries to get through a jagged cut at one point but thirty meters wide, quite a good deal happens.

The Pongo cannot be passed by launches or by boats larger than canoes which can creep from rock to rock or can be hauled up by ropes. It cannot be passed by any craft when the river is rising or in flood. Luck was with me, for the river was falling. My *cholos* were experienced river men and we entered the gloomy gorge, with its towering walls densely clothed with vegetation from top to bottom. Although I took many snapshots, the constant rain precluded clear results. The depth of the water in the gorge, said to be 330 feet, is too great for rapids, but the zigzag course of the raging flood, dashing from side to side of the narrow cañon causes terrible whirlpools; the water wells up from beneath in great domes and standing waves and rushing cross-currents. However, aided by the unusually low water, we crept up along the jagged rock-walls safely and came out at the embayment beyond. As we looked behind, the Sierra del Pongo apparently cut off our retreat, for no passage is visible until one is actually within the portals.

I established camp a few miles above the Pongo, at the mouth of the Rio Santiago, which heads in the Ecuadorean Andes. José joined me in a few days, the canoes and paddlers were sent down the river, and, as if awaiting that, the rainy season began with unprecedented violence and the rivers rose and rose until the roar of the Pongo could be heard for miles.

For three months I camped there, collecting botanical specimens and making short excursions, always by canoe, except once, when I climbed to the crest of the Sierra del Pongo. There were friendly

CANOEING UP THE RIVER

ENTERING THE PONGO DE MANSERICHE
Photographs by Ynes Mexia

RAFTING DOWN THE RIVER

SILK-COTTONWOOD TREE ON THE BANKS OF THE AMAZON
Photographs by Ynes Mexia

Aguaruna Indians living in the vicinity, and José knew a little of their language. We bartered trade-goods with them for chickens, plantains, hearts of palm, and manioc roots, to supplement our dry provisions, as well as for articles of their dress and their feather and shell ornaments. The "boys" hunted toucans, monkeys, and parrots—I can assure you, they are not bad eating. There I passed Christmas of 1931, setting up a little palm-tree under my thatched shelter, trimming it with wild red peppers and poinsettias, and hanging on it some simple presents for my three boys and the mystified but delighted Indians.

We were effectually marooned by the deluges of rain and the flooded rivers; but if we were to get out some day, arrangements had to be made for it. So we bribed the Indians to bring us logs of balsa, the lighest wood known, and with these Neptalí constructed a large raft, binding the logs with tough *lianas,* and raising on it a platform of palm bark. In January there was a pause in the downpours, and the floods subsided temporarily. We loaded the raft with my precious collections of plants and birds and insects, the remainder of the equipment, our four selves and a tiny baby monkey that José had acquired, and, with the Indians looking on, loosed the vine rope that held us and swung out of the Santiago into the Amazon. Valentino and Neptalí stationed themselves at the big oars, and we were swept into the Pongo. The raft was caught by the racing current and was tossed about like a straw. The upper whirlpool, the "Ullco Huacanqui" ("Thou shalt weep bitterly") of the Indians, caught us, whirled us around thrice, then spewed us out, and we sped on our way safely past the second great whirlpool and through the constricted neck. In twenty minutes we had raced through the most dangerous part of the course and the gorge widened. Here we were carried into a circling backwash which swung us around and around in spite of the boys' efforts. The rocks were jagged and it was with difficulty that the raft was fended from them until a lucky thrust pushed us out into the current once more and we floated down the river at good speed.

Rafts are extensively used on the river system of this Upper Amazon basin, especially for freight, and while they are eminently practical, they have some disadvantages. They are unwieldy, their course can only be roughly directed, and, if swept down with the force of the current against one of the many huge stranded trees, the

lashings are apt to be burst asunder and the balsa logs scattered wide with results easily imagined. Or they may be washed ashore by the current, and a raft cannot be backed. Our raft, however, was well made, and we swung merrily down the stream. A palm-leaf thatch was built over the platform and our "houseboat" was most comfortable. A chicken-coop in the back held our remaining poultry, and at a fireplace built at the rear Valentino prepared our meals en route. While the smoke was annoying when the raft drifted tail first, that was the only drawback to the most delightful mode of transportation that I have encountered. I wrote notes, watched the river birds, the beautiful islands and forests, and the great river, and prepared my collections. José's baby monkey insisted on being petted and mothered, and if shut up would cry pitifully. It was a terrible nuisance, but it was so tiny and amusing that one could not help loving the little thing.

At dusk the boys would gradually work the heavy raft toward the shore, but good landing-places were scarce, and we would often be swept down quite a distance before Neptalí could manage to snub us to a tree. A curtain and my cot would be put up, the boys would lie on the uneven floor, we would hear queer wood-noises and would gradually drift off into peaceful sleep. Near Barranca a boat came out to meet us, bringing a huge packet of accumulated mail, some of which was dated August—this was January! Thus for two weeks we floated down the Marañon, and my heart grew heavy as we drew near Iquitos, for my ideal journey on a raft was over.

At Iquitos I packed my collection and started it on its long journey down the Amazon and through the Canal to California, while I continued my journey to the west coast. I took a hydroplane up the Amazon and the Ucayalli rivers to Massesea, an airplane across country to San Ramon in the lower Andes, mule and automobile to chilly Tarma at 10,000 feet in a valley of the Andes, then the Transandean Railroad, which, after crossing a pass at nearly 16,000 feet, drops down a steep incline to Lima and Callao and the Pacific. I had fulfilled my wish to cross South America at its greatest breadth. A steamer brought me up the west coast and back to the bay region, very glad to see familiar faces and places once more.

ICE SHALL COVER NINEVEH

By J. Monroe Thorington
Secretary of the American Alpine Club

MAN in the air above Innsbruck, looking to the south, beholds a glittering wall. It stretches from the Stelvio to the Brenner and beyond, to lose itself in the misty plains of Carinthia and Styria. This is the backbone of the Eastern Alps.

I

In front of the Franz Josef hut, above Heiligenblut in the Möll Valley, three little pigs are standing in line on a crest of moraine. They are like pink balloons about to rise above the sparkling ice of the Pasterzen Glacier. Suddenly they come to life, and, as if propelled by Gadarene spirits, driving them upward instead of downward, they come scampering and squealing toward us.

An old woman, wrinkled and bent, hobbles out of a shed. She produces a stout brush from the folds of her voluminous skirt. The piglets crowd at her knees and grunt in ecstasy while she scrubs them with slow sweeping strokes, humming a song as she does so.

"What do I sing as I tickle my piggies?" She laughs at my question; "only that the Gross Glockner stands clear again after much rain, and that animals should be happy in the sunshine."

She may easily be eighty; she is shy, but curiosity overcomes her.

"You are not from here," she calls; "do you not fear to be so far from home—that you may never find your way back? You will climb the Glockner? That is good. It is beautiful to look down on our fine meadows. You will see the green valley of Kals; it is only a little way off, as a bird flies, but I have never been there.

"I had a brother once who went to America. He brought back a strange green bird, such as we had never imagined. He had the wanderfoot and left again one day. We never heard from him any more. That was more than fifty years ago.

"Did you know that before I was born there were alp-lands nearly to the top of the Glockner? This world of ice that you now see was then a grassy *Alm* where every year a market-fair was held. Once

some peasants refused to go to church. They made ninepins and balls of cheese and butter, played, and denied charity to an old woman. She cursed them and God decreed that the ice should come as punishment. Every once in a while market-wares still appear on the glacier tongue.

"You don't believe it? There is plenty of proof. Why, only two hundred years ago, my great-great-grandfather tried to climb the Glockner, and would have succeeded had his staff not fallen into a crevasse. It made such a peculiar sound that he came back for it. They let him down on a rope, and there, at the bottom of the chasm, was his pole stuck fast in the roof of an ancient châlet."

As I left with my guide, the old lady resumed her brushing of the pigs, and the tune of her song rose and fell in a weird and plaintive cadence. Perhaps it was piped by peasants half a thousand years ago on meadows that lie beneath the ice.

II

"That fellow up there is a congenital prevaricator!" shouts mine host of the inn at Sölden, pounding the table. "He shoots many chamois, and has been a poacher ever since he could walk."

We are old friends, this innkeeper and I, and there is nothing to be done until his sputter dies down.

"At least," I reply, "he told me that you, as overseer of the hunting, would have a pair of horns to spare."

My friend is silent for many minutes, puffing slowly on his long pipe. Finally he leans far out of his chair, reaches an arm under the bed and brings forth a carved wooden box.

"There are a few here," he admits; "but I do not show them to everyone. But you must have something for memories' sake, and perhaps they would be pleased to know that they are to go to America. Chamois do not travel so far every day of the year.

"How much should you pay? I cannot tell. Before the war a good pair was worth two kronen, but now the cost of everything has doubled. Here is a pair from a fine buck, and here another. You shall have them both for four schillings each, and this smaller pair for two. And these tiny points from a young doe (the horn-curve is flatter and the points more blunt) I shall give to you. They are the rarest of all, for no one would desire to shoot an animal so small. I found it dead in a spring avalanche."

III

"For a day in the Oetzthal, when the clouds are down a bit," my guide informs me, "there is nothing better to climb than the Spiegelkogel. It is not the highest nor by any means the lowest, and the great glacier of Gurgl spreads before one like a map.

"You know of our ancient glacial lakes, which were fact, not fiction. Certain glaciers advanced in the seventeenth century and dammed up streams. Lakes formed, broke through, and carried ice and flood as far as Innsbruck and Vienna. It would have been worse had the priests not come up and said mass at the threatening spots.

"But have you ever heard that, once upon a time, the city of Nineveh stood where now one sees the snow-fields of the Gurgler Glacier? I do not know myself whether it is true or not. They say that a pilgrim came there and asked for bread. The people were miserly and gave him only a sour crust. He rebuked them, and, after his departure, the ice came and covered their city. I have heard that he was one of the Three Wise Men."

IV

On the Hinterer-grat of the Ortler, loftiest peak of the Eastern Alps, high up on an airy ridge of snow, two men are linked by a strand of rope. Something shines with dull luster in a cleft of rocks. I pick it up—a spent cartridge.

"Italian," mutters my guide. "Those were sad times here, those war days. Our fine Schaubach hut was destroyed by shell-fire. There, on the pass, you see all that is left of the Hochjoch refuge.

"Austrian guns were mounted on the south peak of the Ortler, and all the way down to the Payer hut we shall find the remains of cables up which supplies were carried during the last weeks of conflict."

The summit is close above us, in the golden sheen of morning light. Only a delicate bit of cliff rises between us and our goal. Soon we shall be standing there.

"Tomorrow, when you cross the Stelvio, you will see the galleries and rock-cut trenches where many men lived and died. They were mountain men, like those cutting hay in the fields by which we passed. There was no hatred in their hearts. Word came from the cities that they must go and kill."

The guide moves on. I follow, meditating on the fate of Nineveh.

SIERRA CLUB

Founded 1892

MILLS TOWER, SAN FRANCISCO, CALIFORNIA

THE PURPOSES OF THE CLUB ARE: *To explore, enjoy, and render accessible the mountain regions of the Pacific Coast; to publish authentic information concerning them; to enlist the support and co-operation of the people and the Government in preserving the forests and other natural features of the Sierra Nevada.*

JOHN MUIR, President 1892 to 1914

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REPORTS OF OFFICERS AND COMMITTEES

Treasurer's Report

To the Directors of the Sierra Club:

The following report on the finances of the Sierra Club for the year ended December 31, 1932, is respectfully submitted. Walter L. Huber, Treasurer

Received: GENERAL FUND

Dues from 291 new members at from $2.00 to $5.00	$1,053.00	
Dues from 1512 regular members at $4.00	6,048.00	
Dues for former years	536.00	
Dues paid in advance	20.00	
Dues at special rates	36.00	
Total dues received		$7,693.00
Interest on savings account	75.44	
Interest on portion of Permanent Fund	549.65	
Sale of club pins	11.70	
Sale of Sierra Club Bulletin	53.20	
Sale of *Place Names of the High Sierra*	12.00	
Sale of *Ramblings Through the High Sierra*	75.00	
Final reimbursement of money expended on Muir Shelter in 1930	1,810.49	
Sundry small receipts	11.23	
Total miscellaneous receipts		2,598.71
Transfer from Permanent Fund for remodeling new rooms		1,000.00
Total received		$11,291.71

Disbursed:

General Administration:		
Salary of Assistant Secretary	$1,380.00	
Extra clerical help	140.27	
Office and storeroom rent, Mills Tower	1,136.25	
Office expense, postage, stationery, etc.	424.76	
Telephone and telegraph	97.10	
Election expenses	108.58	
Traveling expenses—Directors' meeting	145.00	
Sundry small expenses	37.15	
		3,469.11
New Rooms and Equipment:		
Remodeling new rooms, Mills Tower (Additional cost met by private donations.)	$1,500.00	
Expenses of preparation and moving	301.56	
Office equipment	432.40	
		$2,233.96
Contributions:		
Harwood Memorial Lodge Fund	$ 500.00	
Scout Naturalist, Matthes Expedition	200.00	
Mather Memorial, University of California	100.00	
Stewart plaque	25.00	
National Conference on State Parks	50.00	
		875.00
Total (forward)		$6,578.07

General Fund (continued)

Brought forward		$6,578.07
Sierra Club Bulletin:		
Printing magazine number	$3,118.28	
Illustrations—photographs and plates	274.20	
Reprints of articles	74.50	
Title-page and index	72.75	
Mailing	112.31	
Total	3,652.04	
Less receipts from advertisements	63.75	
Net cost of magazine number	3,588.29	
Printing bi-monthly numbers	240.50	
Mailing	156.50	
		3,985.29
Chapters:		
Southern California Chapter	792.75	
San Francisco Bay Chapter	386.75	
		1,179.50
Miscellaneous:		
Library	104.58	
Dues to other organizations	18.00	
Taxes	62.45	
San Francisco local walks schedules	177.05	
Purchase of Soda Springs property certificate	100.50	
		462.58
Total expenditures		12,205.44
Transfers to Permanent Fund:		
Seaver bequest	100.00	
Harwood bequest	1,000.00	
		1,100.00
Total disbursed		$13,305.44
Summary:		
Total received	$11,291.71	
Balance December 31, 1931	2,592.63	
Total		$13,884.34
Total disbursed		13,305.44
Balance December 31, 1932:		
Crocker First National Bank	277.19	
Crocker First Federal Trust Company	276.71	
Office cash fund	25.00	
		578.90

PERMANENT FUND

Received:		
Two new life memberships	$ 100.00	
Bequest—Estate of Henry H. Palmer	3,481.63	
Interest on savings account	161.14	
Transfer from General Fund:		
Seaver bequest	100.00	
Harwood bequest	1,000.00	
Total received		$ 4,842.77
Balance December 31, 1931		15,615.48
Total (forward)		$20,458.25

Permanent Fund (continued)

Total Receipts (brought forward)		$20,458.25
Disbursed:		
Transfer to General Fund for remodeling rooms in Mills Tower		1,000.00
Balance December 31, 1932:		
On hand in Crocker First Federal Trust Company savings account	$ 6,505.75	
Bonds (par value $13,000)	12,952.50	
		$19,458.25

ROBERT S. GILLETTE FUND

Balance December 31, 1932:		
Bond (par value)		$1,000.00

MEMORIAL LODGE FUND

Balance December 31, 1932:		
Bonds (par value)		$5,000.00

LODGE CURRENT FUND

Received:		
Income from investments—Gillette Fund and Memorial Lodge Fund	$ 275.00	
Balance December 31, 1931	513.25	
		$ 788.25
Disbursed:		
Shasta Lodge expenses	530.00	
Less contributions	300.00	
Net expense	230.00	
Salary of Le Conte Memorial Lodge custodian	150.00	
Federal tax	.36	
Total disbursed		380.36
Balance December 31, 1932:		
On hand in Wells Fargo Bank & Union Trust Co.		$ 407.89

NATIONAL PARKS FUND

Received:		
Interest on savings account	$ 75.23	
Balance December 31, 1931	2,131.24	
		$2,206.47
Disbursed: No disbursements.		
Balance December 31, 1932:		
On hand in American Trust Company savings account		$2,206.47

SUMMARY OF FUND BALANCES

Funds:	Dec. 31, 1931	Net Change	Dec. 31, 1932
General	$ 2,592.63	—$ 2,013.73	$ 578.90
Permanent	15,615.48	+ 3,890.27	19,505.75
Gillette	1,000.00	.....	1,000.00
Memorial Lodge	5,000.00	.....	5,000.00
Lodge Current	513.25	— 105.36	407.89
National Parks	2,131.24	+ 75.23	2,206.47
Total	$26,852.60	+$ 1,846.41	$28,699.01

San Francisco Bay Chapter

The past administrative year of the San Francisco Bay Chapter has been marked by the usual activities maintained on an unusually high standard, and by the launching of two new phases of chapter work: a ciné library of Sierra Club activities, and a Rock Climbing Section.

One of the most important functions of the chapter is the conduct of local walks and trips. These help to keep up the interest of the old members, enlist new ones, and get people into an outdoor environment where the club objectives may be most vitally appreciated. From the beginning of November, 1931, through November, 1932, fifty-seven Sunday and holiday walks were held, including two trail-days. Most of these were to various parts of Marin County, but a few covered other nearby regions. In addition there were 18 overnight trips. Attendance averaged 32 members and 16 visitors. Altogether, more than 3500 persons participated, 65 per cent of whom were members. Thus, including repeaters, 1200 visitors, potential members, availed themselves of Sierra Club leadership. The local walks committee, under the chairmanship of the writer, endeavored to continue the policy emphasized during the preceding year, of planning trips to new places. Through the hospitality of owners of private lands, several interesting regions not ordinarily open to the public were visited, namely: the Blair Ranch, near Calistoga; Krysiak's Ranch, in the Russian River country; Barrett's place, from which Loma Prieta was ascended; the beautiful Butano Forest, with its picturesque falls and swimming pool; Middleton's place, another fine setting amongst the redwoods; and Bernal's Ranch, famous for its excellent springs and as a site of early Spanish settlement. Quite unusual was the trip to Webbers' Ranch, when about half the party cruised on the motor yacht "Colleen" up the bay and through the San Joaquin delta lands, arriving beside the levee at the ranch under a full moon. On this trip 139 persons were registered, the largest turnout of the year. For the High Trip reunion camp-fire in September the majestic columns of Muir Woods again furnished an unsurpassed setting.

Advantage was taken of the favorable occurrence of holidays for longer trips. Memorable were the visit after Christmas, 1931, to the club's splendid new Harwood Memorial Lodge in the San Bernardino Mountains, in connection with which we are grateful to the Southern California Chapter for its cordial invitation and generous reception; the snow trip to The Giant Forest in Sequoia National Park, glistening in its white garb under sunny blue February skies; the expedition to Mount Shasta, when some important mountaineering lessons were offered by stormy weather; and the Labor Day outing to Kilborn Lake near Donner Pass, typical high country never before visited by the club.

In furtherance of one of the purposes of the chapter—to promote educational features relating to the aims of the club—a number of meetings were held in San Francisco under the auspices of the educational committee, James W. MacBride, chairman. The plan of bringing some of the directors before the local chapter was continued through talks by Dr. Treat, on "David Starr Jordan," and Mr. Colby, on "Our State Parks." We were also glad to hear about "Sequoias, Past and Present," by J. Barton Herschler, Custodian of

Muir Woods; "Climbing Volcanoes in Mexico," by Newton Bell, traveled Sierran; "Museums in the National Parks," by Dr. Carl P. Russell, of the National Park Service; "Trails and Roads in the National Parks," by Frank Kittredge, Chief Engineer of the National Park Service; "Mountain-Climbing in Canada," a thrilling set of motion pictures to which Don Woods added comments from his personal experiences; "Sparkling Snow and Roaring Water," a fine motion-picture review of the 1931 Annual Outing, photographed and presented by Nathan C. Clark. Besides these were two other sets of slides and motion pictures of the Sierra, and a largely attended visit behind the scenes of the exhibits in the new Academy of Sciences Building in Golden Gate Park.

The social aspects of the club, while subordinate to its major purposes, are nevertheless the source of many cherished associations. During the past year the entertainment committee, headed by J. P. Ferry, arranged a program responsively patronized, including the Christmas, Leap Year, and Hallowe'en parties, an indoor picnic and an outdoor supper, an evening of water-sports, and a musicale that revealed some little-known club talent. The Thanksgiving dinner at Tamalpais Tavern, so successful in 1931, was repeated in 1932. The site of the Tuesday-night dinners was changed to the Pig'n Whistle restaurant on Post Street, where we have received the fine cooperation of the management in connection with after-dinner meetings.

The idea of building up a ciné library of Sierra Club activities, particularly those pertaining to the Sierra, received the encouragement of the chapter executive committee and has been approved by the board of directors. A special committee is now working out a policy and a way for gradually acquiring a collection of high standard, worthy of the traditions of the club.

After the demonstration of rock-climbing with ropes on a local trip to the sea cliffs of Marin County in November, 1931, a few enthusiasts continued practicing in Berkeley's rocky parks and later in the High Sierra during the summer. As a result of their enterprise, interest reached the point where this activity has been officially recognized by the chapter through the formation of a Rock Climbing Section. Richard M. Leonard was appointed chairman of a Committee on Rock Climbing, which will have general supervision of the section. Membership in the section is open to all chapter members who signify their interest; no previous climbing experience being required. The section has held regular meetings since its inception in November, 1932, and indications are that it will not only attract new members to the club, but encourage members of long standing to attain greater proficiency. LEWIS F. CLARK

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SOUTHERN CALIFORNIA CHAPTER

A glance at the calendar of events of the Southern California Chapter for the year 1932 will show a well-rounded program of activity in many different lines. Local hikes, skating, skiing, swimming, tennis, and dancing have all been well supported during the entire year. There has been a distinct movement back to the trails. Camping is becoming more popular, while hotel trade

has taken a slump. A trail committee under the leadership of Ernest Dawson has completed a fine trail from Harwood Lodge to the east ridge—about two and one-half miles. An alternate trail to the same point is practically completed.

Nina Scales and Peter Van Oosting, working with a large ambitious committee, have added many refinements to Harwood Lodge, raising by special parties and individual work the entire amount of money expended; at no time have they had to call on the treasurer for assistance. Draperies have been hung; a fine bookcase built; a wood-storage under the lodge excavated and finished; extensive repairs made to the water supply and minor repairs on the roof; and floors redone. Lighting fixtures appropriate to the setting are under way and will be installed soon. The chairman of the Muir Lodge committee, Margaret Camp, has supervised the renovating of the kitchen at Muir, repairing dormitories and many other smaller items, so that it has taken on a still more comfortable appearance. The Old Baldy Cabin, located at about 7700 feet elevation in San Antonio Cañon, above Camp Baldy, unfortunately was burned down recently by the carelessness of two irresponsible boys, who were reported by the local ranger as having used the place for the night and left a fire going. Promptness by the ranger prevented the starting of a general fire.

On account of the attractive quarters and more adequate accommodations offered at Clifton's Cafeteria, 618 South Olive Street, our Friday-night dinners are now held there. The annual banquet, held this year at the Elks Club, in Westlake Park, was most successful. The attendance was 240—the largest on record. This was made possible by the herculean efforts of a hard-working committee, especially Constance Edghill and Martha Verna. They were able to accomplish this by reducing prices, selecting a few good short talks, and personally inviting every active member.

On October 10th, Ernest Dawson, Phil S. Bernays, Tyler Van Degrift, and D. R. Brothers went to Riverside, at the invitation of Doris Rowlands, to assist in the formation of a new chapter. Fifty-two interested people had gathered at her home, and before the evening was over a complete temporary organization had been effected, with Miss Rowlands as chairman. The necessary fifty members to form a chapter were enrolled in time to place the matter before the Board of Directors on December 3d.

D. R. Brothers, Chairman

Shasta Alpine Lodge

The lodge was opened June 18th and closed October 18th, receiving 511 visitors since closing in 1931. The summer was dry and cool, hard frost occurring in both July and August, and only on two or three days during the summer did the temperature reach 80 degrees. Excepting a light rain and snow on July 18th, there was no precipitation in any form until November 1st. Usually in former years rain, hail, sleet, and snow have fallen in measurable quantities during that period.

Since the lodge was built in 1922 the summer snow-line on Shasta has been

receding, and this summer, like the preceding one, it was at the 12,000-foot elevation. I fear that the prophets who predicted a wet cycle to follow will be without honor in their own country and will rate only as poor guessers. It is claimed by some that devastation of forests affects the rainfall. They have good evidence around Shasta to support their theory. Viewed from its lofty summit, the once forest-clad regions, now barren or covered with brush, present a sad picture of desolation, all accomplished in the name of development. Looking upon it, man might well be defined as an insect allied to the grasshopper, only more voracious, inasmuch as he preys upon all three kingdoms while the grasshopper confines himself to one. The Whitney Glacier began discharging the water from its upper portion over the Red Banks this summer, showing three waterfalls and cutting a deep gulch in the north of Snow Island. If this continues, the contour of the mountain as viewed from the lodge will be considerably changed.

Some improvements have been made for persons visiting the lodge. A trail leading by water and shortening the horse trail by over 1200 feet, without increasing the grade, is now available. The causeway leading toward the summit has been extended nearly one-half mile, so that the way of the climbers will appear as steps into Heaven, steep and stony though they be.

Receipts:

Sierra Club	$230.00
Mount Shasta City Chamber of Commerce	100.00
M. Hall McAllister	100.00
Placer County Board of Supervisors	25.00
Shasta County Board of Supervisors	25.00
Siskiyou County Board of Supervisors	25.00
McCloud Lumber Company	25.00
Total Receipts	$530.00

Expenditures:

Custodian's salary (J. M. Olberman)	$390.00
Pack-train and mail-carrier, weekly	140.00
Total Expenditures	$530.00

J. M. Olberman, Custodian
M. Hall McAllister, for the Lodge Committee

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Le Conte Memorial Lodge

There was little evidence of the prevailing depression in the Yosemite Valley during the summer of 1932, except as interpreted by a larger throng filling the camps, many out of employment finding living conditions more favorable in the outdoor life; contrary to what might have been expected, it was reported Camp Curry enjoyed a heavy patronage.

The lodge was opened to the public on May 1st, and it was found convenient to extend the usual date of closing, August 15th, to coincide with the

last day of the season at Camp Curry, September 11th. However, it turned out that the late summertime brought but few visitors to our door. The register showed for the season over 2500 names, representing from one-third to one-half of the number of those who entered the lodge.

The ranger naturalists, who are doing such fine work entertaining and educating people in the various phases of nature, have from time to time on their walks about the valley brought their parties of from twenty to forty persons into the building, where no doubt the cool rest was acceptable, while the leader talked on subjects often suggested from the interior, such as, for example, the pines of the Pacific Coast, illustrated by the cones of our collection.

To those going into the upper country or taking the John Muir Trail, our set of topographical sheets, covering the latter region, have been consulted with much interest. FRANCIS C. HOLMAN, Custodian

MEMORIALS

CHARLES HOWARD MILLER

The Sierra Club records with deepest sorrow the passing of Dr. Charles Howard Miller, of San Leandro. In his death, February 2, 1933, the club has lost one of its most valuable and beloved members.

Coming with his family to California from Pennsylvania at the age of six, he spent his boyhood days in Redding. Later, entering Lowell High School (then the Boys' High School of San Francisco), he prepared for college. He chose his father's profession, that of medicine, as his life career, and to that end matriculated at the Cooper Medical College, from which he was graduated in 1896. After a year spent with the elder Dr. Barkan, he went to Nevada County, where he was married in 1899 to Maude McKillican. In 1900 he moved to San Leandro, where his professional work has been unbroken for almost a third of a century.

Dr. Miller was an unusual physician and surgeon of great skill and of an unerring instinct in the understanding of people. He was friendly, fearless, tolerant, and readily gained and always kept the confidence of everyone with whom he came in contact. He occupied the important post of District Surgeon for the Southern Pacific Railroad. In his community he was invaluable both in his professional service and in every important civic activity.

Starting on the high trips in 1921, he and Mrs. Miller were with the Sierra Club continuously for eleven years, and every member of these outings will remember him with affection and admiration. He seemed to know just how and when to lend assistance either in camp or on the trail. He was always willing to sacrifice his own comfort whenever his personal or professional services were needed. Particularly all will remember his untiring vigil at the time of the fatal accident to Mr. Morley, and when Miss Fulton was brought out from Benson Lake. The Sierra Club extends to Mrs. Miller and the members of his family the deepest sympathy.

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BARTON WARREN EVERMANN

Dr. Barton Warren Evermann, since 1914 Director of the California Academy of Sciences, in San Francisco, died at his home in Berkeley on September 27, 1932. He was born in Iowa in 1853, was graduated from the University of Indiana in 1886, and received the degree of Doctor of Philosophy from that institution in 1891. Throughout his career he was intimately associated with the late David Starr Jordan, with whom he collaborated in writing several important works on American fishes. Before coming to the California Academy of Sciences he was for a number of years connected with the U. S. Bureau of Fisheries. Of special interest to the Sierra Club is his monograph, published by the Bureau of Fisheries in 1905, "The Golden Trout of the Southern High Sierras." He contributed to the SIERRA CLUB BULLETIN, 1932, xvii:1, pp. 105-107, notes on "Experiences in an Electrical Storm on Mount Whitney in 1904."

NOTES AND CORRESPONDENCE

A Plea for Protection of Point Lobos

It is good to hear that Point Lobos is to be preserved for the American people and for people of other lands. It is worth crossing a continent and an ocean to see. It is, like Shasta, a magical being, an image that remains in the heart and mind to purify and to inspire. It was the first place that I heard about when I came to California, the first place that I was taken to, rushed down from San Mateo by two people who very wisely held that a sight of Point Lobos was the most precious gift they could offer to a stranger. Since then I have seen it many times, always with a heightened sense of its strangeness and its power. Surely nowhere else in the world are there trees that climb the sheer rock as do the cypress trees at Lobos, with the sound of the sea and the thunderous litany of the sea-lions perpetually in their ears.

It is the last and loveliest piece of one of the loveliest coasts in the world to escape desecration. It is imperative to keep it so. If the place becomes a state park, I hope that enough ground will be purchased outside its purlieus to provide for any tea-houses and picnic-grounds that may be necessary. This is not a place to drive through in an auto, any more than a Gothic cathedral is such a place. It is where the magic of a continent meets the magic of the Pacific Ocean, one of those rare and sacred locations that people might approach as pilgrims approach Mecca.

The American people have spent money lavishly to secure the art treasures of the world. Here in their own country is something more unique and more vital. It is not money alone that can secure it.

Point Lobos must be approached in a mood of reverence. It is not a place to picnic in. People should be content to alight from their autos and with reverence enter the grounds on foot. Not only because the gasoline fumes and the vibrations are injurious to the trees, but by carelessly driving through these grounds they cheat themselves of the rapture of seeing a wild and strange spot for the first time. Lonely and strange places are often not accessible to the majority of people. This point is within easy reach. It is wild and strange and lonely almost beyond belief. Why not keep it so?

Ella Young

* * *

January 20, 1933

Editor Sierra Club Bulletin.

Dear Sir: Last winter I contributed an article on "Death Valley" for the Sierra Club Bulletin. In the story, after brief remarks regarding the Dead Sea and a few other depressions, occur the words "Death Valley is the second lowest spot in the world." No! I didn't say *probably*. I looked over my manuscript, and even the stenographer's notes, and found that the statement was made without qualification.

A few weeks after publication you showed me a card from Mr. Odell, who

had been climbing the Himalayas. He came down to report that the author of the article on Death Valley was in error—the Turfan depression in Central Asia is lower than Death Valley. This information was followed by the receipt of a recently revised edition of *U. S. Geological Survey Bulletin 517*, which contained the statement that the Qattara depression in Egypt is 440 feet below sea-level, or 160 feet below Death Valley.

By this time the subject of depressions was unpopular with me for several reasons. In order to take my mind from the world-wide depression in which we are living, I instituted a world-wide search for information on other depressions—physical ones. There is plenty of it to be had, much of it very recent, and I am now prepared to state that Death Valley is *probably* the fourth deepest depression in the world. Exploration in little-known parts of Asia and Africa may reveal others.

Dead Sea still heads the list with an "elevation" of about minus 1300; Turfan, near the geographic center of Asia, is 980 feet below sea-level; Qattara, forty miles south of the Mediterranean, and about halfway between Alexandria and Siwa, comes next, with a point 440 feet below the sea. At present the lowest place in Death Valley is said to be 280 feet below sea-level.

There are now records of four depressions in Asia; fourteen in Africa, of which ten, only recently discovered, are in the Libyan Desert; one in Europe (the Caspian Sea, also partly in Asia); one in Australia; and two in North America. No depressions are known in South America.

Very truly yours, THOS. H. MEANS

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THE YOUTH AND THE ALPS OF EUROPE

It is very gratifying to foreign members of the Sierra Club, and these are all too few, that its interests are so widely international. In the list of "Periodicals and Annuals Currently Received," published in the October BULLETIN, there appeared the names of many of the leading mountaineering journals of Europe and Asia. Among the names listed is the *Mitteilungen* (Reports) of the Deutscher und Österreichischer Alpenverein, known more familiarly as the D. O. A. V. The activities of this club among the Alps of central Europe are very similar to those of the Sierra Club, both in its aims and in its enthusiasm. For these reasons, and because the D. O. A. V. symbolizes the spirit of the youth movement in Europe, it is believed that a note about it will be of particular interest to members of the Sierra Club.

The D. O. A. V. has 236,620 members, recruited mainly from Germany and Austria. All nationalities may join, however, and there are 864 foreign members. It may be judged from its numbers that the club is not an "Alpine club" in the strict sense of the British A. C. with its highbrow qualifications. The D. O. A. V. is a hiking club; and though only a comparatively small number of its members do serious climbing, among them are some of the finest climbers in the world. The recent attempts on Kangchenjunga, in the Himalaya, and the first ascent of the north face of the Matterhorn by the Schmid brothers

are among the greatest mountaineering feats on record. Both stand to the credit of Austrian and German climbers.

There is a *Sektion* of the D. O. A. V. in every important town in Germany, and many of them have made themselves responsible for the building of huts, or *Hütte*, in the German and the Austrian Alps. The mountains have consequently been peppered with high-altitude huts, and so conveniently, that distances between them are generally not more than an ordinary day's march, and one may journey from hut to hut for weeks along the glacier crest of the Alpine range. Compared with Swiss huts, these *Hütte* are, to all intents and purposes, inns—*bewirtschaftet*, or provisioned. They are open to all at every season and at very reasonable rates, and the accommodation in some is extensive. Members of the D. O. A. V. and of allied clubs like the S. A. C. (Schweizer Alpen Club), the C. A. I. (Club Alpino Italiano), and others are given preference, and pay half the modest price of three Austrian schillings for a bed or *Sch.* 1.50 for a mattress. City *Sporthäuser* (Sports Outfitting Shops) allow a discount of ten per cent or even more to members. The huts are well provisioned, and, of course, beer. . . .

"Welches Bier bitte: Dortmunder, Pilsener
oder Münchener, hell oder dunkel?" . . .

. . . without which Teutons cannot exist among hills, is always obtainable. The living falls within Baedeker's "plain but good"; one feeds Teutonically, hugely, magnificently, for the Austrian cooks very well indeed. In short, everything is done to bring the mountain to Mahomet.

But if the D. O. A. V. has made the Alps accessible, it has not made them safe for democracy. The toll of life is considerable. Last year (1931) there were 67 fatal accidents, the year before 76. Serious accidents numbered 120 and 152 for the two years, and less serious accidents 510 and 495, respectively. An average of 725 accidents a year!

In what proportion these accidents occur to lonely climbers, to unguided parties, or to parties accompanied by guides, is not stated in the clubs' *Mitteilungen*, from which these figures are taken. Solitary climbing, though it is easier to deprecate than to pay the exorbitant fees for guides who rob you of your own initiative, should be discouraged. The fact remains, however, that the majority of these young German and Austrian climbers, often with surprisingly little experience, do climb without guides and often even *"ganz allein."* Many, as has been noted, get killed; but that, at any rate, is a fulfillment, in a sense, of the urge they feel in life.

A story is told of some young Germans who applied for permission to take part in an expedition to the Himalaya. It was pointed out to them that the expedition might entail loss of life, to which the Germans replied that they would enjoy losing their lives on an interesting expedition. This describes the spirit of many of the more serious members of the Deutscher und Österreichischer Alpenverein. It is the spirit of young Germany today, and out of it has evolved an almost national movement, the social and political consequences of which have still to be appreciated as a force in Europe.

But interest in the Alps is not confined to the two hundred and fifty thousand

odd members of the D. O. A. V.; it is shared, though to a lesser degree, by the other countries of Central Europe. One may be returning in winter from any of the hill stations en route for Vienna, Munich, Geneva, or Basel; the train, a special ski-train, stops at intermediate stations to pick up skiers. The platforms along the route are packed with the density of a New York subway station at the rush hour. Five or six hundred pairs of skis with ski-poles, hung from the skis' tips, rise like a forest from above the heads of the crowd. It is a thrilling and inspiring sight. The skis are placed in ski vans specially designed for them, and with commendable despatch the train is off again, filled for the third or fourth time to overflowing. As in winter, so in summer, except that coils of rope, ice-axes, and crampons take the place of skis and ski-poles.

This migration is not local; it extends the length of Europe from the western Alps in France to the Carpathians. Every week-end throughout the year the youth of central Europe have access to the mountains at a cost that is within the reach of almost all. This life and all that it implies has become for them as much a part of their existence as the business of earning bread; it has become a means of expression, a compensation for the world of economic and social repression in which many of them live. It is a wonderful and invigorating outlet for youthful energy.

The tendency to guideless and lonely climbing, however much deprecated by the sententious, is fostered by this spirit, which one might as well try to suppress as the progress of industrialism. This urge to live intensely is as much the expression of an age as the crinoline, and must not be judged by Victorian or Edwardian standards.

Skiing and mountaineering have become for these people a national sport, and there is no question of the proficiency that many have attained. Tradition will see to it eventually that this standard is not lowered by those whose recklessness has been the cause of so many mountaineering accidents in recent years.

The Hague, Holland. A. EVERARD GUNTHER

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GRASSHOPPERS AND BIRCH BARK — TWO LETTERS FROM JOHN MUIR

BY FRANCIS P. FARQUHAR

Two letters from John Muir, which, so far as I can ascertain, have not heretofore been published, have recently come to light. They are so characteristic of Muir, so full of his eager spirit, and so delightfully whimsical, that they are added to his published writings at this first opportunity.

One of these letters is remarkable in that it is written on a card of birch bark. The card is trimmed square, measuring 3 x 4 inches, and the writing is in pencil, on both sides. It reads as follows:

Dear Mrs. Carr. October 1873.

Coming down the Kearsarge cañon I saw and heard a thicket of breezy birches—and of course they said Carr. Gray says there are no birches in California, but no country with a Carr can be birchless. You

say you love the sun and the South; but there is far more birch and pine in you than there is banana and palm. Long live the loving Carrs and Birches. JOHN MUIR.

This letter was written during a trip from Yosemite, through the High Sierra, to Mount Whitney, and belongs in the sequence of Muir's correspondence just before the letter dated October 16th, 1873, published in Badè's *The Life and Letters of John Muir*, vol. I, p. 392. Examination of Muir's diary discloses that he descended from Kearsarge Pass October 13th. He doubtless gave this letter to his companions, Dr. Albert Kellogg and "Billy" Simms, to post at Independence, while he set out for Mount Whitney.

The other letter, here reproduced (Plate XXXI), is closely associated in spirit and subject-matter with one in *The Life and Letters*, vol. ii, pp. 10-27, It is apparently a leaf torn from a sketch-book. There is no writing on the reverse. For convenience in reading it is repeated in type:

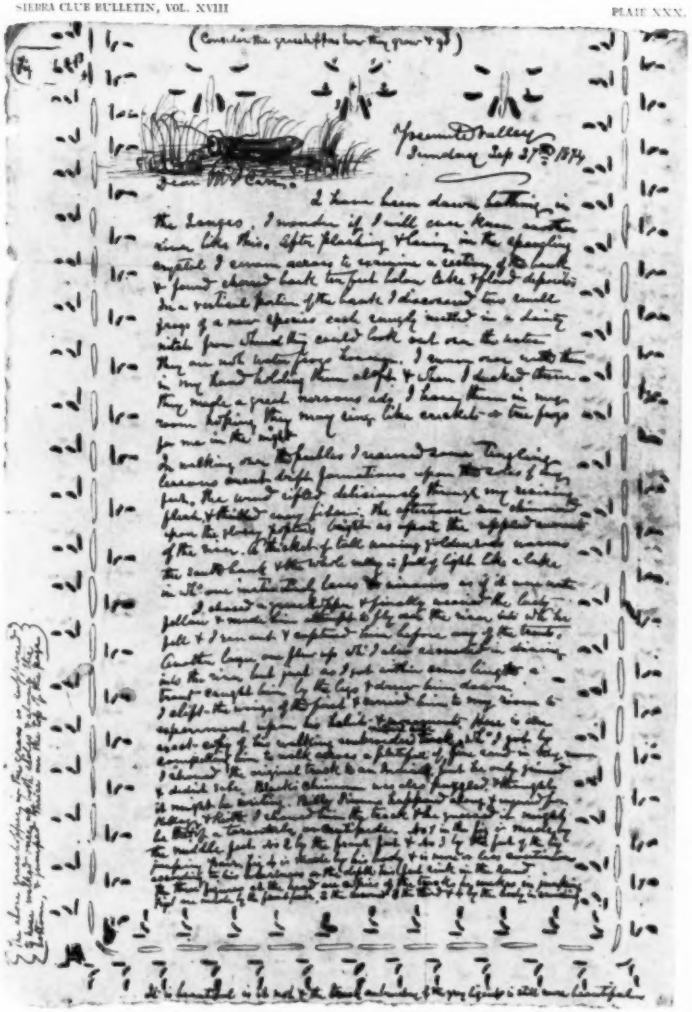
(*Consider the grasshoppers how they grow and go*)

Dear Mrs. Carr. Yosemite Valley Sunday Sep 27th 1874

I have been down bathing in the Ganges. I wonder if I will ever know another river like this. After plashing and laving in the spangling crystal I swam across to examine a section of the bank and found charred bark ten feet below lake and flood deposits. In a vertical portion of the bank I discovered two small frogs of a new species each snugly nestled in a dainty nitch from whence they could look out over the water. They are not water frogs however. I swam over with them in my hand holding them aloft and when I ducked them they made a great nervous ado. I have them in my room hoping they may sing like crickets or tree frogs for me in the night.

In walking over the pebbles I received some tingling lessons anent drift formations upon the soles of my feet. The wind sifted deliciously through my reviving flesh and filled every fiber. The afternoon sun shimmered upon the glossy poplars bright as upon the rippled currents of the river. A thicket of tall waving goldenrods warms the south bank and the whole valley is full of light like a lake in which one instinctively laves and winnows as if it were water.

I chased a grasshopper and finally wearied the lusty fellow and made him attempt to fly over the river into which he fell and I ran out and captured him before any of the trouts. Another larger one flew up which I also succeeded in driving into the river but just as I got within arms length a trout caught him by the legs and drew him down. I clipt the wings of the first and carried him to my room to experiment upon his habits and movements. Here is an exact copy of his walking embroidered track, natural size, which I got by compelling him to walk across a plateful of fine sand in my room. I showed the original track to an Indian, but he only grinned and didn't sabe. Blacks Chinaman was also puzzled and thought it might be writing. Billy Simms happened along and inquired for Kellogg and Keith. I showed him the track and he guessed it might be that of a tarantula or centipede. No 1 in the figure is



LETTER FROM JOHN MUIR TO MRS. EZRA S. CARR
Yosemite Valley, September 27, 1874
(Size of original, 12⅛x8½ inches)

GIANT JUNIPER OF THE STANISLAUS
Circumference (breast-high), 42 feet 9 inches
Photograph by Clarence K. Bennett

made by the middle feet; No 2 by the front feet and No 3 by the feet of the big jumping pair. Fig 4 is made by his body and is more or less continuous according to his weariness or the depth his feet sink in the sand. The three figures at the head are copies of the tracks he makes in jumping. Figs 1 are made by the front pair, 2 the second, 3 the third and 4 by the body in crouching.

It is beautiful is it not, and the track embroidery of the gray lizard is still more beautiful. The above grasshopper in the grass is supposed to have walked once up both sides and along the bottom, and jumped thrice on the top of the page. [John Muir]

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The Largest Juniper?

By Clarence K. Bennett

A number of years ago, while on a camping-trip along the Sierra crest between Lake Tahoe and Yosemite, I came across a great monarch among Junipers, one that I feel sure must be one of the very largest of its kind. I did not take its measurements, but some day I shall seek it out and learn its size for comparative purposes. More recently I was led, by one who knew of my interest in the subject, to another tree, which I veritably believe to be the largest Juniper in the Sierra. It stands upon the divide between the middle and south forks of the Stanislaus River, Tuolumne County, and within the Stanislaus National Forest. (Dardanelles quadrangle, U. S. G. S.) To reach it, one takes the Eagle Creek trail from Brightman Flat to Lone Meadow Creek and up that small stream several miles until one nears its source. There, at an elevation of about 9500 feet, on the slope of a volcanic ridge leading north from East Flange Rock, about three miles east of Eagle Peak, stands this Lord of the Junipers.

It is a remarkably well-preserved tree, notwithstanding its many hundreds of years of exposure to the rigors of Sierra winters. Its dimensions, carefully measured, are: circumference at the ground, 57 feet 6½ inches; six feet from the ground, 42 feet 9 inches; greatest diameter at the ground, 21 feet 6 inches; average diameter at five feet above the ground, 14 feet 2 inches. So deep are some of the flutings of the trunk that the actual circumference at the ground, following the bark, is 61 feet 9 inches. The height is estimated to be about 85 feet.

The Sierra Juniper (*Juniperus occidentalis*) is one of the most interesting of all trees; yet no writer, within my knowledge, has given due recognition to its merits. John Muir, to be sure, accords it appreciative mention in *The Mountains of California* (1894, pp. 204-207) and describes two large specimens growing at the head of Hope Valley. He remarks that "Some are undoubtedly over 2000 years old." I find no reference, however, in the standard manuals to a precise count of rings. Yet a tree such as the one described must be of immense age, for the growth is slow at such high altitudes, as is shown by the fine-grained and closely ringed wood. On exposed cliffs and ridges the Juniper seems to defy time and the elements. Excepting when caught in an avalanche of ice or snow, or when blasted by lightning, it continues to stand until only a

mere shell or fragment remains; but even then it will often be found with a single limb throwing out a vigorous growth of leaves and berries.

Much has been written of other remarkable trees of the Sierra and their splendid settings, especially of the Big Tree (*Sequoia gigantea*). But be it remembered that the Juniper begins to flourish at about the elevation at which the Big Tree leaves off, and that it enjoys an even finer setting, high on the ramparts and flanking spurs of the great peaks. Its site invariably commands an inspiring view. From the vicinity of our Lord of the Junipers, for instance, one looks off in every direction upon country teeming with pioneer history. To the east stands Sonora Peak, dominating the pass of the same name. A little to the south stand Relief Peak, Kennedy, Grizzly, and others, through whose passes and cañons the immigrants fought their way. Here and there, one comes across a pile of stones or a record carved on a tree, tokens of tragedies which took place during the heroic struggle. The very names are significant—Emigrant Meadow, Relief Meadow, and others. More should be written of the stirring episodes that occasioned these names. But there is an even earlier history, the evidences of which are everywhere apparent. The vast ridges of volcanic rock, dominated by the Dardanelles, speak of the great outbursts of lava which once flooded the country, only to be, in turn, eroded and carried away by glaciers and other conquering agencies. This area, perhaps more than any other in the Sierra, suggests to the mind those titanic forces which reddened the sky at night with the light of glowing lava or by day darkened the sun with showers of volcanic ash.

When next an opportunity occurs, go into this area and seek out this Juniper, which among trees represents so vast a time, a time comprising perhaps the whole span of our so-called civilization. Pass it not by quickly, but, in quiet contemplation, let the majesty and the vigor of this great monarch leave their impress upon you.

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Scientific and Vernacular Names for the Species of Sequoia*

By Willis Linn Jepson
Member Committee on Nomenclature, International Botanical Congress

When Stephen Endlicher in 1847 erected his genus *Sequoia* he possessed certain material of the Redwood of California. On the basis of this material he named two species, *Sequoia sempervirens* (which had been named *Taxodium sempervirens* much earlier by Lambert) and *Sequoia gigantea*. California botanists soon learned that the material representing these two so-called species of Endlicher are simply different stages of growth to be observed on nearly every Redwood tree. *Sequoia gigantea* Endlicher was and is, therefore, an invalid name; it became a synonym of *Sequoia sempervirens;* and the specific part of the name, *gigantea,* was available for further use.

Then the Big Tree was discovered, and John Lindley, English botanist, promptly erected a new genus for it and named it *Wellingtonia gigantea* in 1853. The French botanist Decaisne, after seeing specimens, recognized the

* Proposals have from time to time been made to drop the name "Big Tree" in favor of "Sierra Redwood," "Giant Sequoia," etc. This is Dr. Jepson's answer.—Editor.

tree as belonging to Endlicher's genus *Sequoia*, and he published the tree as *Sequoia gigantea* Decaisne in 1854. In 1855 Seeman published the name *Sequoia Wellingtonia* for the same Sierran tree.

In accordance with the International Rules of Nomenclature adopted at the International Congress of Botanists at Vienna in 1905, it is permissible to use a specific name again when its first use is invalid. For example, *Sequoia gigantea* Decaisne is a valid name for the Big Tree, in spite of its previous use for a different species. At this Congress a small but influential portion of the American (U. S.) delegates refused to accept the overwhelming vote of the Congress on this matter, bolted the Congress, returned to the United States, and with their followers promulgated what has been known as the "American code." The most important rule in this code is the one which says that an invalid species name can never be used again; "once a synonym, always a synonym." Interestingly enough, this American group secured by a comparatively narrow vote the adoption of this rule at the International Congress of Botanists in 1930 at Cambridge, England. The valid name of the Big Tree, under the International Rules, is now, therefore, *Sequoia Wellingtonia* Seeman.

It may here be said, parenthetically that in my own articles and books I have always used the name *Sequoia gigantea;* but no supporters of the American code should be allowed to use the binomial *Sequoia gigantea*. They are the authors of the measure which rendered such a name as *Sequoia gigantea* invalid and *Sequoia Wellingtonia* valid. The name *Taxodium Washingtonianum* Winslow (*Sequoia Washingtonia* Sudworth) has no standing in any case, since the International Rules have never at any time recognized as scientific publication names printed in a newspaper.

Common or vernacular names are an entirely different matter. They have no relation to rules. They arise in the speech of the people and are established solely by custom. There are a large number of technical rules which govern the establishment of a Latin name for a plant, safeguarding identity, precision, and intelligibility. No such rules can, obviously, be applied to vernacular names. The common name, Big Tree, has been the folk name for *Sequoia gigantea* for a period of almost eighty years. It is in the widest possible use. It is a true folk name, as all common names should be. It represents in the common speech of the folk, simply and ultimately, all that can be said about the one tree on the earth's surface to which this name peculiarly belongs. It is the last word in full respect, in deep homage—the Big Tree. It makes upon the beholder a mental and spiritual impression exerted by no other tree. And this of all men. I have known the roughest and least cultured of mountaineers, who at a question fell into hushed silence, and then spoke a few simple words reverently and gently, in memory of the days when they had stood in awe before the Big Tree, though it were three full decades agone. No one can ever mistake the meaning when a Californian says Big Tree.

Folk names cannot be changed by fiat or by legislation. Big Tree, moreover, has entered the literature in the widest way for eighty years. It is found in every kind of printed matter—popular literature, commercial publications, newspapers, works of geography and travel, scientific books, and in *belles-*

lettres. It is doubly enshrined in one of the finest poems produced in California. Even as early as 1870 Bret Harte had no difficulty in recognizing the common name of the folk when he wrote his poem entitled "On a Cone of the Big Trees." If one were absolute monarch of all the Californias, Alta, Baja, North, and South, he might say to the name-changer: "I grant you the right to make a change in its name, but I decree that you first prepare a complete bibliography of all the literature which uses the name Big Tree (referring to *Sequoia gigantea*)." No one individual that now lives could by any possibility perform that task in a lifetime!

The name Redwood for the coast species of *Sequoia* is likewise deeply embedded in the speech of the folk. All that has been said of the name Big Tree can be said of it. It is true that either name may at times be misused. Any name whatsoever will be. The best common names carry folk-lore, fragrance, and melody. These name-changers attempt to set up a confusion. If scientific precision is desired, the Latin names should be employed. That is what they are for. Scientific precision has never been attributed to common names. Such names as Oak and Pine are constantly misused, but not *Quercus* and *Pinus*. Let him who wishes to do away with error by legislation pause and consider.

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The Great Sequoia Avalanche*

By Walter Fry

A Big Tree (*Sequoia gigantea*) grove in Sequoia National Park was the scene of the greatest-known avalanche in the southern Sierra, and this mighty landslide occurred within comparatively recent times. On December 20, 1867, the north side of Dennison Mountain broke away and dropped into the South Fork of the Kaweah River about 15 miles above Three Rivers and about 42 miles east of Visalia. Apparently without warning, several hundred acres of land and timber crashed 3000 feet into the South Fork Cañon. The devastated area is in one of the most heavily forested regions of sequoia, pine, and fir within the park, and is in the very heart of the Garfield Big Tree Grove. Many of the sequoias were from 20 to 30 feet in diameter, and from 250 to 300 feet in height. The ages of the larger trees undoubtedly ran into the thousands of years. The pines and firs were particularly large and fine. I have made a survey of the area involved, and estimate that about 350,000,000 board feet of timber was destroyed. No other figure could better bring out the enormity of the loss to the park.

The devastated area is between the elevations of 6000 and 7500 feet, is about 2½ miles in length, and from 1500 to 4000 feet in width. The avalanche appears to have started near the crest of Dennison Ridge, below 8000 feet. It gathered such volume that, upon reaching the river, it formed a dam half a mile wide and over 400 feet high, completely across the cañon, and entirely stopped the flow of the river. Naturally, this barrier backed up the stream into a great reservoir Finally the loosely formed dam broke, and the flood swept down the Kaweah River, carrying with it thousands of tons of crashing

* Reprinted from *Bulletin No. 8, Historical Series, Sequoia Nature Guide Service*, Sequoia National Park, November 12, 1931, by courtesy of Superintendent John R. White.

trees and débris, and spreading for miles over the San Joaquin Valley. Today, sections of huge sequoia trees will be found in the valley, scores of miles from the groves in the mountains and great distances from present river beds.

Early settlers of the Three Rivers and Visalia districts have told me of this great flood of 1867. Joseph Palmer, a homesteader, was the only person in the South Fork Cañon on the night of December 20, 1867, and the statement I obtained from him on October 5, 1890, runs as follows:

"It had been raining in the Three Rivers district almost steadily for 41 days and nights with heavy snows above the 5000-foot level. All the rivers were very high. On the morning of December 20th, the weather became warmer, and a hard rain fell all day, even at high elevations. It was still raining when I went to bed that night, and a strong wind blew down the cañon. Just before midnight I was aroused by a heavy rumbling sound such as I had never heard before, and which lasted for an hour or more. Then a great calm set in, and even the roaring of the river ceased.

"On leaving my cabin in the morning, I found that despite the heavy rain the river was low. From this I knew that a great slide had blocked the cañon above, and that later the dam would give way and cause a flood. I went up the river to Bennett Creek, but saw nothing wrong; returned and watched all day, but no flood came, so I went to bed at 10 P.M. About 1:30 A.M. I was aroused by a tremendous thundering and rumbling sound which made my hair stand on end. I jumped out of bed, grabbed my clothing, and ran for safety up the mountainside some 200 yards from the river. In a few minutes the flood came along with a breast of water some 40 feet in depth that extended across the cañon, carrying with it broken-up trees, which were crashing end-over-end in every direction with terrific force and sound. The river remained high for several days, and all the while timber was going down and being swept clear out to the valley."

It is interesting to note what old settlers say about the flood upon its reaching Visalia. In the past I have obtained statements from several of these, whose names and the dates of their statements are as follows:

A. J. Samstag (May 14, 1902): "I was living in Visalia at the time of the '67 flood. The flood reached Visalia prior to midnight on December 23. The water was about five feet in depth. There were logs and driftwood floating everywhere. Some poultry and live-stock were drowned."

Ira Blossom (June 2, 1906): "I was working in the grist-mill in Visalia at the time of the '67 flood. It came some time prior to midnight on December 23d. The water was about six feet in depth at the mill. There were logs and driftwood scattered for miles around. Many sequoia logs were left out at the Hilliard place. Some stock was drowned."

Margaret Oaks (October 24, 1925): "I was living in Visalia at the time of the '67 flood. It occurred in the night a few days before Christmas. The water was five feet deep where I lived. One big redwood log was left by the flood right along the side of the grist-mill. Much live-stock was drowned."

Betty Townsend (January 31, 1926): "I was living out near Cutler Park at the time of the '67 flood. The flood occurred on the evening of December

23d. Mr. and Mrs. S. C. Brown, Mr. and Mrs. Dineley, Frank Kellenberg with his son Frank, Jr., and four other people sought refuge in my home that night, and remained as refugee guests for a week. Our Christmas dinner, in part, consisted of a turkey feast. The turkey was captured by one of the party from a bale of hay which was being swept down the torrent. A pig was similarly rescued and consumed."

The major immediate causes of the avalanche were the geological formation of the area and the prevailing conditions of the weather. The devastated area was on a mountainside resting at about a 45-degree angle. A rich sandy loam, ranging in depth from five to twelve feet, lay over the solid granite formation of the mountain. When the soil down through to bed-rock became thoroughly saturated by the heavy rains, and then weighted down by heavy snows, the loosened mass, with all its timber and vegetation, slipped into the cañon below.

Because of its recent occurrence, we consider the crashing of this vast tract of land from the mountainside as a major event in the eyes of mankind; yet it is only a small incident in the age-old geological history of the Sierra, which records the constant recession of the mountains to the valleys below.

Although the Garfield Big Tree Grove has been reduced by about one-third of its former size, it still remains third in order of the groves within the Sequoia National Park. Careful estimates indicate some 1600 trees over 10 feet in diameter preserved in this grove alone.

Residents of Visalia may wonder if another flood will ever reach their city from such cause as the one described above. This seems unlikely, as nowhere else in the Kaweah River Basin is there any soil and forest condition so favorable to an avalanche as that on the South Fork which slid in 1867.

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Recent Additions to the State Park System

By William E. Colby
chairman, california state park commission

Point Lobos.—Transfer of title to Point Lobos to the State of California was made on February 8, 1933, when deeds to the property were filed in the office of the Recorder of Monterey County, at Salinas. Administration of the area as a state park will begin at once. Point Lobos, four miles south of Carmel, is crowned with the only native grove of Monterey Cypress remaining intact, now safeguarded under state ownership. The State Park Commission plans to keep this area accessible for public enjoyment under conditions which will assure the preservation of its scenic charm and scientific interest.

Approximately 350 acres at Point Lobos have been acquired in fee by the state, and when completed the project will embrace 400 acres. More than three miles of scenic coastline are included within the present park area. While the main point has been acquired through purchase of $600,000 and by a gift of fifteen acres on the outer headlands from the heirs of A. M. Allan, former owner, it is necessary to secure possession of additional acreage along the coast at the northern boundary of the park reserve in order to round out the project in accord with the recommendation of Frederick Law Olmstead, land-

scape architect, in his official State Park Survey of California in 1928. The State Park Commission has asked the Point Lobos Association to secure one-half of the fund of $100,000 needed to acquire this area. Mrs. Robert Hunter, of Santa Barbara, is president of this association, which is nation-wide in scope, and Mr. William H. Crocker, of San Francisco, is treasurer. Inasmuch as the $600,000 already expended has come from California, it is hoped that much of the additional amount will come from the country at large as gifts from those who value the preservation of American scenery.

Cuyamaca Rancho.—Cuyamaca Rancho, recently acquired as a state park, lies in the east central part of San Diego County, and is along the headwaters of the Sweetwater River, which runs through the property in an area known as "Green Valley." Green Valley is a comparatively broad, open valley rising to mountains both on the east and west. Cuyamaca Peak, on the west boundary, has an elevation of 6500 feet and its eastern and northern slopes are heavily wooded with yellow pine, sugar-pine, and incense-cedar. The view, both to the west and to the east, is exceptionally fine, as it is the highest point in that part of the state. The elevation of the lower end of the valley is approximately 4000 feet, and the upper end, which abuts on Cuyamaca Lake, one of the reservoirs of the San Diego water supply, is about 4700 feet. It is usually covered with snow in the winter and in the summer is cool at night. It will provide an exceptionally useful camp and recreation area for residents of Imperial Valley who wish to escape the heat of the valley, and to residents along the coast who wish to get a change of climate for a short time in the summer. The property is approximately seven miles long and five miles wide, and contains, roughly, some 21,000 acres. It is the major part of an orginal Spanish grant, and is about in the same condition (with the exception of a few farm-buildings) as it was in the early days of the Spanish occupation. We consider ourselves exceptionally fortunate in being able to add this area to the California State Park System, which now comprises some 80,000 acres of mountain, coast, and woodland areas.

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Letters from Other Clubs

MAZAMAS

In a major way, we are looking forward to an extensive winter-sports season at our new lodge on the slopes of Mount Hood. During the last few years, our members have provided themselves with up-to-date equipment, and are now in a position to enjoy winter sports more than ever before. We hold an annual tournament each winter, and the date this season will probably be about the middle of February.

Our annual outing next summer will be held at Mount Jefferson; probably with a main camp in Jefferson Park on the north side of the mountain and a fly camp at Pamelia Lake on the south side. We are planning an inexpensive trip this year in contrast with our outing to Mount Garibaldi, B. C., last summer. The latter trip was not an expensive outing in comparison with past

years, but was quite expensive considering present business conditions. We hope to be able to schedule next summer's trip at a cost of approximately forty dollars for the two weeks. This will also include transportation.

We, of course, schedule local walks each week-end, and are planning two such trips on the same week-end, when one of them is expensive or is extremely arduous. This gives those who cannot afford the expensive trips and those who for physical reasons are unable to make long and difficult trips an opportunity to join with the others in a purely local walk. It is also possible that the club will sponsor a winter climb up Mount Hood this year. If so, participants will be limited to experienced climbers, and their equipment will be fully inspected before leaving.

Our Wednesday-evening meetings in the clubrooms in Portland will, of course, continue throughout the year. The House Committee is in charge of these meetings, and is assisted by various other committees which provide entertainment, educational programs, etc. These are well attended.

We shall have a very definite summer climbing program, including all of the snow-capped peaks of the Cascade Range within week-end reach. Besides this, we will feature a number of educational and research trips to lesser elevations on the glaciers or other points of interest. You perhaps have heard of the buried forest discovered by Judge Fred W. Stadter, one of our members, several years ago. This is well above timber-line on Mount Hood, and has proved of great interest to those making the trip. There have been scheduled trips to it, and since then stumps have been found below White River Glacier, on the south side of the mountain, which deserve investigation this coming year.

These various activities are headed by a committee of persons keenly interested in their particular subject, and they are met with enthusiastic response and support by the club membership at large. REX H. BUNNAGE, President

APPALACHIAN MOUNTAIN CLUB

The Appalachian Mountain Club has run much its usual program of trips this year with certain curtailments owing to the depression. We added a horseback trip through the back roads of central New Hampshire which proved very popular, and which will probably be continued and developed in the future. However, it should be noted that the system of the club is not entirely to run its own trips, but also to develop independent climbing by educating its members to climb on their own. Mountaineers from the club have this last year, as usual, climbed in the West and in Europe. Both the skiing and the rock-climbing groups have been very active. Ski-races started this last year and promise to become an important item in our winter program.

Two new huts have been opened, the Galehead Hut and the Zealand Falls Hut, in a part of the White Mountains that is little known and undeveloped from a tourist viewpoint. This makes eight huts in all maintained by the club.

The Berkshire Chapter has completed the cutting and marking of the Massachusetts section of the Appalachian Trail. This two-thousand-mile crest-line trail from Katahdin in Maine to Mount Oglethorpe in Georgia is now almost completed.

The club has made some constitutional changes, eliminating from the Council the Councillors of Art and of Natural History, and adding a Councillor of Huts and the Editor of *Appalachia*. This represents a changed view of the importance of the various departments.

With the creation of the White Mountain National Forest and the taking over by the Forest Service of many of the important trails, the club is coming to have less to do with the development and maintenance of trails, with the result that conditions in the White Mountains may in time resemble those in the West in that respect.

Our very lively program of meetings has been continued as usual. Included were lectures by Sven Hedin on his Asiatic explorations, and by Frau Dyhrenfurth, who showed the moving pictures of the 1930 International Expedition to Kangchenjunga. MIRIAM E. O'BRIEN, Corresponding Secretary

THE MOUNTAINEERS

Among the many and varied activities carried on successfully by The Mountaineers during the past year, skiing holds a prominent place. Its development has been marked by the growing practice among enthusiasts of venturing farther and farther afield as they have gained skill and experience. The mountains of the Northwest furnish magnificent opportunity for this rare sport.

In the spring of 1932 the Mountaineer Players presented in their Forest Theater a charming performance of "Ali Baba and the Forty Thieves." The admirable dramatization of the story was the work of Miss Harriet Walker, one of the players.

The "Guardians of the Columbia," Mounts St. Helens, Adams, and Hood, were the goal of the twenty-sixth annual summer outing, many members of the party climbing all three peaks.

The club's magazine, *The Mountaineer*, issued in December, carried a color reproduction of a painting by Annah Wright Rogers of Doctor Edmond S. Meany, president of The Mountaineers since 1908. The portrait has recently been acquired by the organization, and hangs in the club-rooms in the Rialto Building, Seattle, Washington. WINONA BAILEY

THE COLORADO MOUNTAIN CLUB

The gradual disappearance of unexplored mountain regions in Colorado and adjoining states has worked something of a change in the Colorado Mountain Club. The exploration of such regions is no longer possible, and, most of our higher peaks having been climbed, it has become apparent that many of them, splendid though they may be scenically, cannot hold the interest of serious climbers as easily as many of our lesser but more rugged summits. A more specialized form of mountaineering is therefore interesting an ever-increasing number of our members. There is a growing interest in technical climbing, and an accompanying interest in documentation, in the improvement of maps and charts, in the preparation of guides, and in the description of new climbs and new routes.

The Ice Lake Basin region in southwestern Colorado, which the club visited

on its summer outing last August, afforded many opportunities for the exercise of such activities. The outing camp-site was in the midst of peaks of which very little, in a mountaineering sense, was known. None of them are as much as 14,000 feet in elevation, and this may be one reason for our neglect of them in the past. The success of the outing amply demonstrated, however, that we need not restrict our extended trips to regions with many 14,000-foot peaks. A number of first ascents of varying importance was made, and some useful records prepared. Many of our younger climbers attended, and they are to a large extent responsible for its success as a climbing outing.

Our members have not, however, confined their climbing activities to the outing alone, but have, during the past summer, climbed in many sections of the state, notably in the Sneffels and Grenadier regions. The north face of Sneffels was climbed by a party in July, and in August a party of two explored the Grenadier Range, making an ascent of Arrow Peak.

There are many fine climbs in almost every section of the state which have not yet been worked out. Some evidence of what will be done in the future appears in the fact that on the north face of Longs Peak four new routes have been established during the past season, routes which are fine rock-climbs, fine enough to excite the interest of expert climbers. (The usual route up Longs Peak is one of the most popular climbs in Colorado, some 1100 people making it yearly by way of the comparatively easy, though strenuous, southwest face.)

Trail and Timberline, our monthly publication, has been devoted mainly to articles of specific information about skiing, about climbing, and about regions in which these sports may be enjoyed. Other publicity of the club has included a series of skiing-instruction articles in a Denver newspaper, and various articles on mountaineering or nature-study subjects, which our groups in other cities have sponsored in their local newspapers. Several of our members are at work on a climbers' guide to the San Juan Range, which we expect to publish when it has been proved by experience to be accurate and useful.

Skiing continues to be the major activity of the club in winter, and weekly skiing trips into the foothills for the early snows, and into the high mountains later in the year, when successive snows have provided a substantial foundation there, are scheduled, and increasingly well attended. A number of skiing classes have been arranged for the coming winter, and there may be noted a determined effort on the part of many of our skiers to improve their technique. The winter outing at Fern Lake, in Estes Park, has come into its own, partly because skiing has achieved its deserved status as Colorado's first winter sport, and partly because the droughts of previous years can now be forgotten in the great snows which have again covered our high-mountain country.

DAVID ROSENDALE

CLUB EXPLORACIONES DE MEXICO

Walking clubs are progressing steadily in Mexico. There being but a limited number of automobile roads in the country and very few private machines, hiking does not have the formidable competitor that it has in the United States.

Motor busses, however, reach many points that could not be visited on the railroad or trolley car. The hiker travels second-class, and transportation is in general rather cheaper in Mexico than in the United States. At the latitude of Mexico, hikes can be comfortably taken at altitudes of 3000 feet and upward; below 500 feet the climate is tropical and rather unhealthy. Among the mountain ranges east and west of the great central plateau there is an abundance of beautiful scenery—pine woods, mountain lakes, waterfalls, deep gorges, huge caverns, and unknown peaks. We have the wonderful Balsas River, described in "Little Mexico" by William Spratling, where one can navigate on rafts past shoals of crocodiles and flocks of ibis. We have the three great volcanoes, and four or five others over 14,000 feet.

Little by little the country opens up to hiking. A newly founded chapter in Uruapan, composed of a group of enthusiasts, reaches a paradise on earth in its vicinity. The group in Jalapa reaches a verdant mountainous region in Vera Cruz State to the east. The chapter in Toluca also visits a wonderfully picturesque region in the State of Mexico, with cliffs, waterfalls, forests, and snow mountains. A strong club, the Ixpomalin, exists in Puebla (7 Sur 507 is the street number). They lead the largest groups up the Malinche, and have quite won over what were considered towns of bandits and dangerous Indians. There is also a club in Mexico that calls itself the Sierra Club (Uruguay 64, altos 4), but it does not work under your statutes. The "Confederacion Nacional de Clubes Excursionistas" (San Juan de Letran 7) is quite active. They have an affiliated club in Orizaba, called the "Legion de Orizaba," that sends big parties up the Pico de Orizaba, another in Ciudad Guzman, Jalisco, not far from the Nevado de Colima, and one in Tapachula, Chiapas, that has made trips to the volcanoes of Guatemala. There are less active chapters of our club in Acapulco, Guerrero, and Tulancingo Hidalgo, besides other groups that make regular hikes from Monterey and Santa Rosa.

Our new address is La Palma 40, Mexico City. OTIS MCALLISTER

MOUNTAINEERING NOTES

Mountain-Climbing on the 1932 Outing

Notes by Glen Dawson

An increasing interest in mountaineering technique was shown on the 1932 outing of the Sierra Club. More ropes, ice-axes, and Tricouni-nailed shoes were in evidence than ever before. Norman Clyde, the club's mountaineering genius, gave his time to guiding parties up interesting peaks. Three prominent Eastern climbers (Lincoln O'Brien, Thomas Rawles, and William Jenks) were on the first two weeks of the outing, and gave generous help to those interested in learning more about the sport. At the Sphinx Creek camp instruction in rope-climbing was given on some cliffs up the cañon. A large number of enthusiastic Sierrans took part. One of the most important developments last summer was the appointment of a mountaineering committee to supervise all serious climbing. The committee sponsored ascents, gave advice as to the advisability of climbs, and in other ways helped the management. With a large number of inexperienced climbers, it is evident that some sort of supervision is necessary.

Triple Divide Peak.—The first real climb of the trip was that of Triple Divide Peak, on July 12th, by Norman Clyde, Lincoln O'Brien, Thomas Rawles, William Jenks, William Dulley, Julie Mortimer, Alice Carter, and Dorothy Baird. The party, caught by clouds, was unable to return to camp that night, but suffered no severe hardship.

From Sphinx Creek Camp.—Between North Guard and Cross Mountain there is a splendid peak (12,871), which was climbed by two parties on July 17th. There was no evidence that it had been climbed before. The highest point is a large slab almost overhanging the steep eastern face. The first party consisted of Norman Clyde, Julie Mortimer, Alice Carter, and Dorothy Baird. The second party, in two caravans, included Thomas Rawles and Lincoln O'Brien (leaders), Patricia Goodhue, John Schagen, Glen Dawson, Arthur Neild, Katharine Linforth, William Dulley, D. R. Brothers, and Alfred Weiler. Mount Brewer was climbed by eighteen persons in three parties, led by Norman Clyde, William Horsfall, and Nathan Clark, respectively.

From Vidette Meadow Camp.—Vidette Meadow is a fine base camp for a number of ascents. Directly above are the Kearsarge Pinnacles, among which several parties found interesting climbs. Thomas Rawles, Glen Dawson, and Hans Helmut Leschke succeeded in climbing the most difficult of the group. Several parties climbed University Peak and Mount Gould. The Beckett brothers climbed Mount Rixford on July 19th, and a day later Nathan Clark led a party of eighteen to the summit. Included in the latter party was Mary C. Rixford, daughter of Dr. Emmet Rixford, for whom the peak was named. On July 20th James Rennie climbed the East Vidette, and on the following day eight made the ascent under the leadership of Norman Clyde. Walter

NORTHERLY VIEW FROM THE SUMMIT OF MILESTONE
Photograph by Nathan C. Clark

GLACIER-POLISHED GRANITE

DETAIL OF A HIGH SIERRA SNOW-FIELD
Photographs by Nathan C. Clark

Brem and Hans Helmut Leschke traversed both summits of Deerhorn. They climbed the east peak by the northwest arête. Harold Bradley and Emily Ann Lillie climbed Mount Bradley, named in 1898 in honor of Harold's grandfather, Cornelius B. Bradley.

Junction Peak.—Last summer the Sierra Club doubled the number of names on Junction Peak. On July 22d Wilson Harwood and Page Beckett climbed it from Foresters Pass. The next day, when the club went over the pass, the following made the ascent: Jules Eichorn, Owen Ward, Glen Dawson, Thomas Johnston, Ernest Arnold, Francis Farquhar, Thomas Penney, Mildred Ehrhardt, Eliot Moses, Augustine Allen, Lee Stopple, Harriet Taylor, Norman Clyde, Donald Ruth, Stanley Stevenson, and Harry Young. The last three were members of the Forest Service trail crew. Several of the above descended by way of Diamond Mesa. The register on the summit recorded a remarkable ascent on August 21, 1929, by A. R. Ellingwood, who followed the ridge from Shepherd Pass.

From Milestone Camp.—The Kern River above Milestone Creek is an excellent climbing base. Seldom-visited Thunder Mountain was climbed on July 24th by Julie Mortimer and Norman Clyde, and on the 26th by William Horsfall, Glen Dawson, and Hans Helmut Leschke. Milestone proved a popular climb. Forty-six reached the top. Table Mountain was climbed by a new route, from a cirque in Milestone Creek, by Norman Clyde, Emily Ann Lillie, Dorothy Baird, Alice Carter, William Dulley, and Rose Marie Pischel. William Horsfall reached the highest point of Stanford, the first ascent in twelve years.

Fourteen Thousand Feet.—The Sierra Club offers a certificate to members who climb five peaks of 14,000 feet or higher. Several members completed their five on the outing, and four persons (Wilson Harwood, Jack Beckett, James Smith, and John Forbes) climbed five 14,000-foot peaks in one week. One large party made the long trip to Williamson (14,384): Ralph Arthur Chase (leader), Lee Stopple, Leland Chase, Wilson Harwood, Harriet Taylor, James Smith, James Barr, John Forbes, Jack Beckett, Richard Beckett, Doris Rowlands, Augustine Allen, and Arthur Atkins. Tyndall (14,025) was climbed by Roy Crites, Emily Ann Lillie, Loraine Hart, Florence Manetta, James Barr, John Forbes, William Horsfall, John Poindexter, William Dulley, Eliot Moses, Jules Eichorn, Elizabeth Penney, Robert Lipman, Paul Paine, Alberta Reed, Ralph Reed, Walter Huber, John Hackstaff, Thomas Penney, Inezetta Holt, Vera Crail, Sydney Schlesinger, Lewis Clark, Mortimer Benioff, Page Beckett, Jack Beckett, Wilson Harwood, and James Smith. Barnard (14,003) was climbed by Ralph Arthur Chase, Leland Chase, John Forbes, Page Beckett, Jack Beckett, Wilson Harwood, and James Smith. Whitney (14,496), highest peak in the United States, has a remarkable charm. A total of 153 persons made the ascent on July 28th. A large number started after camp-fire, reaching the summit early in the morning. Several of the packers were with the group (on foot!). Even the usually unsympathetic commissary boys were represented on the Whitney climb. Four of them (Joseph Chamberlain, Selah Chamberlain, Bernie Miller, and Covington Pringle) went directly up a chute on the west face in the remarkably short time of 2 hours 35 minutes from camp to summit,

apparently establishing a new route. Thirty-nine persons also climbed Muir (14,025). Two parties climbed Russell (14,190) by the south side. Jules Eichorn, Glen Dawson, Walter Brem, and Hans Helmut Leschke went up the west couloir and down by way of a narrow couloir leading into Whitney Creek. Both the ascent and the descent were by new routes. The other party (Norman Clyde, Francis Farquhar, Alice Carter, Julie Mortimer, Dorothy Baird, Thomas Penney, and Emily Ann Lillie) went by the way of the east couloir described by A. E. Gunther in *S. C. B.*, 1929, xiv:1, p. 86.

Kaweah Peaks.—Only three persons (Page Beckett, Wilson Harwood, and Dr. Kaspar Pischel) climbed the once-popular Kaweah. Red Kaweah was climbed by Glen Dawson, Jules Eichorn, Norman Clyde, Julie Mortimer, Alice Carter, Emily Ann Lillie, and William Dulley. Black Kaweah was the object of four carefully organized parties, who knapsacked to the base of the peak. The first party (William Horsfall (leader), Lee Stopple, Alfred Weiler, and Augustine Allen) climbed on August 1st. The next day the following made the ascent by the regular route: Norman Clyde (leader), Julie Mortimer, Alice Carter, Mildred Ehrhardt, Dorothy Baird, Harold Bradley, Emily Ann Lillie, and William Dulley; Francis Farquhar (leader), Lewis Clark, Eliot Moses, Thomas Penney, Page Beckett, and Wilson Harwood. Glen Dawson, Jules Eichorn, and Walter Brem ascended by the southwest ridge to the west ridge, and thence to the summit, the only route yet found other than the regular one, and only twice previously traversed (McAllister and Campbell, in 1927; Ellingwood and Blaurock, in 1928).

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Midwinter Ascents of Shasta and Lassen

By Oliver Kehrlein

Mount Shasta and Lassen Peak afford splendid opportunities for winter climbing, both because of the accessibility of their bases, and because of the persistence of their snow-mantles. An easy climb in summer, Lassen can provide in winter the thrills and difficulties of a major Sierra ascent. Helen Lake is a good site for a base-camp, as it is close to the peak and only a short distance from the ever-steaming Bumpas Hell. The sixteen miles that separate it from the highway at Mineral can be shortened by working up the cañon from the Sulphur Works, west of Diamond Peak. This will prove a full day's ski trip. As storms sometimes occur almost daily, a good snow-camp is advisable among the sheltered trees at the eastern end of the lake, whence it is but a mile to the southeast ridge, up which the summer trail zigzags. As this ridge receives the northerly blasts, the snow is usually well-frozen, so that crampons and ice-axe should be taken. On one occasion our party fought its way up this ridge in a blizzard which on a peak of higher altitude might have prevailed against us. We were extremely glad to climb over the rim into the protection of the crater with its steam-heated snow-grottoes formed by the fumaroles, which are at their best in the winter. We counted nine of them within the crater. All about us was a strange contrast of darkly contorted lava-masses and delicately etched snow-figures. Even the dullest of imaginations can run riot when geology and

meteorology concoct such phalanxes of grotesque monuments. At the very summit we found buried in the snow a yearling deer that had been caught by a storm and had climbed there to avoid the coyotes and wildcats.

From the highest pinnacle the usual panorama is strikingly accentuated by the brilliancy of the colorings. Vivid green forests are set against backgrounds of scintillating white; and dark volcanic cliffs stand out in bold relief. One beautiful touch is missing from the landscape we know in summer—all the dainty little lakes have lost their hues of blue and are now flat snow-fields that must be searched for. Cinder Cone, ordinarily dark and forbidding, and the well-named Chaos Crags are but snow-mounds garbed innocently in white. But the most glorious spectacle is Shasta, snow-covered to the timber-line, its valleys and lower reaches lost in mist, so that the gigantic iridescent mass seems suspended in mid-air.

The descent can be made in two slides of a thousand feet each. The first slide, down the east face, should be made at the southerly edge, as the northerly side ends in abrupt cliffs. It should be tested with rocks before starting. Swinging around to the south face, another fast slide brings one to the "parking area" less than a mile from camp. After lunch, by cutting across the ridge, one can drop down into Bumpas Hell, where the cold atmosphere causes the steam-clouds to rise to great heights, and all the other well-known caloric manifestations stand out in strange contrast to the frozen background. Lakes of boiling water are set off with banks of snow to their very edges; hissing geysers appear to spring from the very depths of the snow; sputtering mudpots seem to hesitate and become confused as the falling snow chokes their orifices. Here one may, if he is careless, slip on ice and be severely scalded. The return trip to Mineral is seventeen miles down-hill, a veritable paradise for tired skiers.

Not so simple and hospitable have we found Shasta. Five consecutive winters our party attacked its frozen peak in March and each time met with reverses. Finally, the day of our climb came between two storms, and victory was ours. On one occasion we were caught in one of those thick, windless snow-storms, in which we could not see a hundred yards. All blazes were buried deep beneath the snow and landmarks were obliterated. The ridge-pole of the Sierra Club Lodge had long since disappeared beneath this white blanket. Seven of us camped that night in three snow-covered sleeping-bags. Another time, we slipped and slid and hacked thousands upon thousands of steps, when the whole mountain was glare ice from Horse Camp to Misery Hill. Simply, the day wasn't long enough to cut steps to the summit. We have tried climbing in soft snow, with snow-shoes, to which we attached crampons for the steeper slopes, only to become involved in a snow-banner rising off the northern face, against which progress was not to be made.

Most trying of all was the winter we battled a true sub-zero arctic blizzard, when wind of high velocity seemed to pick up the whole landscape and engulf us. We wallowed in a dense swirling mass of frozen pellets driven with tremendous force. They seared our faces and searched out every opening in our clothing. At 11,000 feet we despaired of success and, turning our backs on the wind, made our way down to hot soup and warm bags.

Nevertheless, with weather conditions right, the winter ascent of Shasta far surpasses the summer climb, in beauty as well as in comfort. The long pull up to the Red Banks is broken by frequent rests, during which one may wonder at the contorted forms assumed by the wind-blown snow and may admire the white-capped ranges of the Trinity Alps. The Red Banks are easily overcome through one of the icy couloirs, and Misery Hill, now frozen hard, is less trying than when bare. A bracing north wind refreshes one and adds zest to the climb. The snow about the summit and in the crater has been fashioned by the wind into fields and banks of long, attenuated, fern-like forms that often extend for several feet. They present the appearance of acres of ghostly ferns bent by the wind and frozen in place. The summit pinnacle is a solid mass of delicate lacey protuberances, which, while beautiful, make footholds and handholds uncertain. The only spots free from snow are those around the little solfataras in the crater. On these natural stoves we melted snow and made hot drinks. The clearness of the winter atmosphere extends the summit panorama far into Oregon on the north, and on the south to a point which appears to be Mount St. Helena. Distant peaks and ranges stand out, with their sparkling helmets of frozen jewels suspended above the distant haze as if in mid-air.

The downward trip, from the Red Banks almost to the cabin, is a succession of fast slides, especially rapid if made just at sunset when the snow has become crusted-over. On the occasion of our successful climb we were brought to a standstill half-way down. A new storm was rising and snow-banners were streaming from every ridge and shoulder. As they came between us and the setting sun, the startling effect made us gasp. Each cloud of snow, as it rose and waved in the air, took on a vivid hue, some a brilliant green, others red, purple, and orange. Shasta seemed to celebrate our success by presenting to us the rarest of her glorious displays.

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Charleston Peak, Nevada

By S. A. Kozff, E. G. Williams, and J. Reed

To those who love the mountains, and to whom a mountain which presents a real problem is one of the necessities of life, Charleston Peak, in southern Nevada, can be unequivocally recommended. Its forests, its fine girdle of limestone cliffs, and the superb panorama from its summit, entitle it to a very high rank among southwestern mountains. Add to this a peak which, owing to its difficulty and inaccessibility, is seldom visited—probably not more than forty people have stood on its summit—and which is unspoiled by tourists, you have a location very desirable to the mountaineer. There are several approaches to Charleston, by far the best of which is the Kyle Cañon route to the Charleston Park resorts. It can also be reached via Lee Cañon, though the road is not good, and from the west side, via the Pahrump Valley, over yet worse roads. Having arrived at the park, thirty-seven miles from Las Vegas and 7500 feet above the sea, the visitor is pleased with the freshness, coolness and greenness,

in contrast with the desert which surrounds it for over a hundred miles in all directions. After a night at this altitude he is ready for an early start up the mountain. And early it must be, for he has a climb of 4500 feet ahead of him and a trek of some sixteen miles by the shortest route. The summit is rounded, and represents the highest point on a long curved ridge running approximately north and south. The "standard" route to the ridge is almost due south from the park, up to a saddle south and east of Cathedral Rock, a spectacular limestone bluff that dominates the camping-ground. Thence the ridge leads slowly upward to the summit. Although this route is long, it is far less steep than the more sporting climbs up the face of the mountain. A more difficult route leads first up the main Kyle Cañon to a fork at 8500 feet. Thence it proceeds left to a waterfall, then directly toward the summit, which looms high above.

In making the first ascent of 1932 we decided to follow the main cañon up farther. After several turnings we met a waterfall at about 8900 feet, and circumvented this by climbing a snow-slope on the western side, continuing up the valley to the second waterfall, where a thin stream cascades from quite a height. At the base the altimeter read 9500 feet. At this point we left the valley and tackled the steep cliff on the left, as this seemed the most vulnerable point on the sheer limestone wall above the cañon. This led to quite a scramble for the next 500 feet, in which the rope was used. At the top of the cliff we had a splendid view of the upper waterfall and the valley. The most exhausting part of the climb followed, where a steep snowslope led up through the woods toward the summit. At about 11,200 feet we came out into the open again, this time at timber-line. A very fine avalanche-track scarred the steep slope of the gully on the right, and a snow cornice overhung the head of the ravine. Ahead lay the final pyramid, reached now by ascending several small cliffs, like a series of giant steps of about thirty feet each, between which the ground was fairly flat. The last of these was followed by a long talus-slope leading onto the crest of the ridge, then by a longer but much easier slope to the final summit. Some very nice Devonian-fossil corals were picked up in the last talus-slope. On the summit the altimeter, when corrected, read 12,100 feet. This is in agreement with the estimates of army aviators who recently flew close to the summit. The Geological Survey reconnaissance map was made in 1908 under considerable surveying difficulties. Consequently the official elevation is subject to error; it seems reasonable to suppose that the altitude given is about 200 feet too low. From the top the High Sierra forms a magnificent panorama to the west, with Telescope Peak, Death Valley, and the Argus Ranges in the foreground. To the northwest, 170 miles away, the great mass of White Mountain rears its crest over 14,000 feet skyward, easily the most dramatic object on the horizon. On the north and east many smaller mountains are seen, and a very distant one was believed to be Volcanic Mountain, above Cedar Breaks, in Utah. Mount Trumbull, in Arizona, is easily seen, as is the North Rim country of the Grand Canyon, and the mountains near the Hoover Dam site. On the south the spikes of the New York Mountains tempt the climber. Southwest stands southern California's giant, San Gorgonio, just visible against the horizon, nearly 200 miles distant.

Crossing Tioga Pass on Skis

By Dennis Jones

After I had experienced the greatest thrill of my life in crossing the Sierra from Soda Springs to Lake Tahoe, I decided that I was through with competitive skiing and jumping in favor of long cross-country skiing. So, when Miss Milana Jank, who had had wide experience in skiing in the Alps, asked me to go over Tioga Pass with her, I gladly accepted. Miss Jank and I left Soda Springs by automobile on Tuesday, March 1, 1932, for Bridgeport, Nevada. Five miles below Sweetwater we became stuck in the snow and had to send the car back and continue on skis to Sweetwater. The snow was very fast, hard, and icy, and we came tearing up in front of the hotel and stopped with a cross jump. The proprietor had never seen modern skiing—in fact, had never seen a kick turn. When he witnessed our cross jump he was dumfounded. Yet he lived in a perfect setting for skiing—wonderful mountains and perfect snow. After dinner, Miss Jank and I rode in the back of a truck to Bridgeport, arriving about midnight. In the morning we were astounded to find ourselves surrounded by the most perfect ski-terrain imaginable—very long steep slopes without a tree or rock in evidence. We could not understand why the residents were not enthused over their wonderful conditions. But no one there had ever seen a Christiania swing. We left Bridgeport for Mono Lake at eight o'clock in the morning, each packing about thirty-five pounds. About half-way to Mono we decided to abandon our food, so as to lighten our packs to about twenty pounds each. We reached Mono Lake, a distance of twenty-seven miles, at two o'clock. We decided, in spite of facing a terrific gale, to ski from Mono Inn thirteen miles to the start of the Leevining grade. At five o'clock we arrived at the station of the Southern Sierras Power Company, where we were hospitably received.

At seven o'clock the following morning we set out in a slight snow-storm accompanied by a strong wind. By the time we reached an altitude of about 8000 feet the wind was so terrific that we could hardly keep our balance. We were in the clouds, with a fine icy mist blowing directly in our faces. We slowly fought our way along the wall of Leevining Cañon, carrying our skis and cutting steps in the ice. By ten o'clock we were on safe terrain again, and at ten-thirty we were at an approximate elevation of 9600 feet and above the clouds. The sun was shining and the wind had abated. At one o'clock we were at the summit. The sun was bathing the snow-covered peaks, and the snow was hard-packed and in perfect condition for speed and for Christiania swings.

We started down, through trees, on a very steep slope. We must have gone ten miles before we stopped to set our course. Neither of us was familiar with the terrain; but we decided to take our direction by the sun and head straight for Yosemite. We dropped down and crossed the lower end of Tuolumne Meadows, and after some difficulties found our way to Lake Tenaya, which we reached after a wonderful run at high speed. We crossed the lake to its outlet, but soon found the course too precipitous, so we climbed the ridge to the north and descended on the other side just as the sun was

setting. We continued rapidly for two or three miles, until the approaching darkness made fast travel too dangerous, so we decided to stop and make our camp. We collected green boughs to sit on, built a fire, and sat back against a tree, with our feet in our knapsacks, and began the long wait until daylight. By midnight our fire had burned down about eight feet into the snow, and we had to let it go out. It was bitter cold; later we were told that it was fourteen degrees at Snow Creek Lodge, and it must have been even colder at our higher elevation.

At sunrise we found that we had stopped just above a sheer drop of about two hundred feet, and, as it was impossible to get down in that direction, we decided to try the next cañon. We made a long climb to the ridge, then started down a steep wooded slope. Soon we came across ski-tracks, which we followed for about a mile, and at nine o'clock arrived at the Snow Creek Lodge. We had covered about 130 miles in thirty-six hours of skiing. The remainder of the journey to Yosemite was quickly accomplished after a most welcome breakfast.

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Mount McAdie

Mount McAdie, a 13,800-foot peak on the main crest south of Whitney Pass, was named by Church and Marsh on their attempted winter ascent of Whitney in 1905 (*S. C. B.*, June, 1905, v:4, p. 317). Norman Clyde has climbed it at least twice (*S. C. B.*, 1929, xiv:1, p. 86), but few others, if any, have made the ascent until this year, when it was climbed by Morgan Leonard and Glenn Rickenbough on June 20th, and by Dick Jones and Glen Dawson on September 4th. The latter party went from Ibex Park, past Consultation Lake, to the pass between McAdie and Mallory; climbed the south peak of McAdie first, then went on to the north peak, which is a little higher.

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Southern California Chapter Expedition to the High Peaks

Southern California Chapter of the Sierra Club is taking an increased interest in mountain-climbing which may be attributed in part to the 14,000-foot certificates. Over the Labor Day vacation about 40 climbed Whitney and nearly half that number climbed Muir. A smaller group established a base-camp at timber-line on Tyndall Creek and made ascents of Williamson, Tyndall, and Barnard.

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Climbs of the Fourth Scout-Naturalist Expedition, 1932

The fourth of a series of annual scout-naturalist expeditions, organized by Ansel F. Hall, Chief Naturalist, U. S. National Park Service, visited Yosemite National Park. While much of the time was taken up in assisting Mr. François E. Matthes, U. S. Geologist, in scientific research work, yet a great deal of fine climbing was accomplished. A motion picture was made by Robert Kissak, of University Film Foundation, Cambridge, Mass., with Beverly Blanks, Robert

Ray, and Richard M. Leonard as the principal climbers. The first climb was Starr King; then Clark. Leonard climbed the highest pinnacle of Sunrise Mountain—perhaps a first ascent, as no record was found on top. A number of climbs was made from a base in Matterhorn Cañon, including Finger Peaks, Whorl Mountain, Matterhorn Peak, and Quarry Peak. Leonard and Blanks reconnoitered the Sawtooth Peaks, climbed Point 11,555 (a first ascent), and, with others of the party, made extensive explorations among the ridges and plateaus of this remarkable region. Later, a motion picture was made of the climb of Cockscomb by the northeast face. The glaciers of Lyell and Maclure were visited and a number of the boys climbed the two peaks. This was followed by a climb of Ritter by the entire party. During the trip of seven weeks instruction was constantly given in the use of the rope and other safeguards of climbing. The culminating achievement was a first ascent by Leonard and Blanks of a spectacular pinnacle, or narrow ridge, standing between the two southern glaciers of the Minarets. Although not distinguishable on the U. S. G. S. map, it can be located by reference to the letter "R" of "Range." It was designated by the party, "East Pinnacle of the Minarets." [Other pinnacles of the Minaret Range are now commonly known as "Clyde's Minaret" and "Michael's Minaret," it is suggested that this one be called "Leonard's Minaret."—F. P. F.]

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Climbing the North Face of Mount San Jacinto

By Howard J. Sloan

The San Jacinto Mountains, situated about half-way between Los Angeles and Imperial Valley, are frequently visited by members of the Sierra Club. The western and southern slopes are covered with many varieties of pine, cedar, and fir, and hundreds of small streams wind down over the mountain slopes. An auto road from Banning to Idyllwild winds through a portion of this country and several trails lead from Idyllwild to the summit of Mount San Jacinto. The eastern and northern sides of the range, however, rise abruptly from the desert near Palm Springs and San Gorgonio Pass. These sides of the mountains are entirely different from the others, in that the lower parts are desert-like and the steep slopes are gouged out in gigantic rocky gorges containing high waterfalls, deep pools, and roaring rapids.

Looking down from the summit of San Jacinto, I have often wondered if it would be possible to climb up or down through the gorges, and on several occasions I prospected the route. At last, in April, 1932, I undertook to make the attempt in company with Morgan Leonard and Glenn Rickenbough. We left Los Angeles on April 15th and arrived at the Whitewater Ranch just before midnight; and at five o'clock the following morning set out on the trail.

At six-thirty we arrived at the end of the trail, and began scrambling up through the heavy underbrush, soon finding ourselves at the edge of the cañon formed by Falls Creek, which was completely filled with a great mass of snow appearing much like a small glacier. At the upper end were several large falls, above which the cañon turned slightly to the left as it lead to the great gorge through which we must pass in order to gain the slide on the north face.

Passing the falls by climbing up the cañon wall to our left, we reached a ridge which led us to the edge of the snow at the mouth of the gorge. As we progressed into the gorge, the snow became steeper and we were forced to zigzag. We reached a turn in the gorge and beheld above us another long sweep of snow.

The walls of the gorge now became less sheer and we were able to climb along the rock at the edge of the snow. At a fork in the cañon we took the branch to the right. We were getting into higher altitude and breathing became more difficult. The result was that we would travel up a hundred feet or so and then sit down on some handy, protruding rock in order to rest. At eleven o'clock we came to another fork in the cañon and again took the branch to the right and climbed up along the rock on the right-hand side of the snow field. The summit, which for a long time had been hidden, now came into view, still high above us. After an hour's rest we set out again and soon came to a place where three great snow slides merged into one to form the cañon we had been following. Up the slide which came directly down the north face of San Jacinto we made our way. There were few exposed rocks, so we had to make the best of it on the hard snow. Five hundred feet from the top we were forced to leave the slide because it became too steep and the snow became so icy that it was impossible to make footsteps. We then climbed up on the right side of the slide, where we found great boulders surrounded by deep snow. These boulders were piled one on top of another and among them grew gnarled, weather-torn pines, with the help of which we were able to climb from one boulder to another. At length we came to a ridge, up which we scrambled, until at last we came out on top, arriving at three o'clock, ten hours from Snow Creek.

The descent was not without its difficulties and moments of excitement, and it was dark by the time we reached the trail.

[NOTE: On May 29-30, 1932, R. S. Fink climbed Mount San Jacinto, starting from the fish hatchery on Snow Creek. He had some difficulty in passing the waterfalls of Snow Creek and, higher up, found the snow in bad condition for climbing.—EDITOR.]

BOOK REVIEWS

TREES OF YOSEMITE* Those who enthusiastically gather up twigs and cones for identification, only to throw them impatiently away at the prospect of looking through an ordinary text for help, will find this attractive book a first-class guide. Beginning as a collection of unusual designs obtained from the cones on the floor of Yosemite Valley, it grew into an informal discussion of the trees commonly found in Yosemite National Park, and how they could be recognized. It is a friendly book, containing much worth-while information, entertainingly told, with here and there an interesting touch of history. Always aware of the beauty of the trees, the author carries one along the familiar trails, now to view "the clear, splendid shaft of the Yellow Pine" beside the river, then on to higher elevations where "lie the dense mats of the White Bark Pine, flattened by the long season of heavy snows." Even the blue jay, filling his cupboards against a rainy day, does not escape her eye.

The book is illustrated by thirty-four linoleum block-prints of trees, sprays, and cones, the last particularly pleasing in composition and pattern. Several charts on the classification of trees and a list of references complete it. Not too heavy to carry in a knapsack, this book will provide many interesting discussions on the trail; slipped into the car when the family takes a holiday, it will be a constant help in answering the ever-recurring "What's that tree?"

ETHEL BOULWARE

HUMAN HISTORY OF YOSEMITE† There is not the slightest record to indicate that a white man had seen Yosemite Valley before 1833. In October of that year Joe Walker's band of mountain-men crossed the Sierra and, if the account of Zenas Leonard is correctly interpreted, gazed into the valley from a point on the rim, perhaps near Yosemite Falls. Indians, to be sure, lived there, but there is no other fact about them that could be called history. Excepting for this one event, therefore, the history of Yosemite does not begin until three years after the discovery of gold in California, when a rapid succession of events led to the placing of Yosemite Valley among the famous wonders of the world. Until the publication of Dr. Russell's "One Hundred Years in Yosemite," popular knowledge about this period of discovery was derived principally from the publications of Bunnell and Hutchings. Since the days of these writers, however, considerable additional information has been brought to light, much of it through the efforts of Dr. Russell. Consequently, it has been possible to review and recast the story in more com-

* *Trees of Yosemite.* A popular account by MARY CURRY TRESIDDER. With 34 linoleum block-prints by DELLA TAYLOR HOSS. Stanford University Press. 1932. xiv+133 pages; illustrations. Price, $2.00.

† *One Hundred Years in Yosemite.* By CARL PARCHER RUSSELL. Stanford University Press. 1931. xvi+242 pages; illustrations; maps. Price, $3.50.

prehensible form. Dr. Russell has done this most successfully. In doing so he has raised the figures of the discoverers—Savage, Boling, and Bunnell—into a clearness of outline which they have not heretofore enjoyed. The delineation of the character of Major Savage, in particular, is a notable contribution to California history.

As the book progresses, however, the chapters have a diminishing interest. The coming of the tourists and the days of saddle-travel are picturesquely set forth, and there are details of several lively episodes. A lack of balance in the selection of material becomes apparent when one realizes the omission of accounts of such features as the early surveys and the first ascents of the principal peaks of the region, and of such events as cluster around the names of John Muir, Joseph Le Conte, Harry C. Benson, N. F. McClure, Therèse Yelverton, and John Lembert. This deficiency is compensated for in part by the very useful chronology and by other details to be found in the appendix. There is, moreover, an excellent bibliography. The book contains many novelties in the way of illustrations, which are well-selected and well-reproduced. All in all, Dr. Russell's books constitutes a thoroughly reliable and highly entertaining story of "early human affairs in the Central Sierra Nevada."

F. P. F.

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LAST OF THE YOSEMITES* Maria Lebrado, granddaughter of Chief Tenaya, shared with her family and other members of the Yosemite tribe the expulsion from their home in 1851. Eighty years later she died in her cabin eight miles east of Mariposa. Mrs. Taylor tells with tender regard and keen insight the story of this remarkable woman. The first portion of the little book deals with Maria's visit to Yosemite in 1929 and the memories awakened by the return to her childhood home. The second portion records her death and describes the dignified burial ceremonies. The form and printing of the book, as well as its contents, cannot fail to arouse admiration.

F. P. F.

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CACTUS GARDENS† Many enthusiasts who are absorbed in the hobby of growing cacti received their initial interest from glimpsing these unusual plants while on a jaunt to the desert, their native habitat. The novel trek to our southwestern deserts in winter or spring has progressed into a fad; likewise cactus gardens have advanced in popularity. Whether you have ever taken the trip, or hope to go, or have become fascinated in making a cactus rockery, you will find interesting and useful data in this book, "The Fantastic Clan."

Herein is a combination of scientific facts and cultural directions pertaining to the cactus family. John James Thornber, Professor of Botany in the University of Arizona, depicts in non-technical manner the structure, relationship,

* *The Last Survivor.* By MRS. H. J. TAYLOR. Johnck & Seeger, San Francisco. 1932. 20 pages; illustrations. Price, $1.00.

† *The Fantastic Clan: The Cactus Family.* By JOHN JAMES THORNBER and FRANCES BONKER. The Macmillan Company, New York. 1932. xiv+194 pages; illustrations. Price, $3.50.

and distribution of these spine-clothed oddities, so different from other growths in the plant kingdom; while Frances Bonker tells how to grow them. These co-authors take you with them on their several excursions into Mexico and our southwestern states along the highways and byways of desert waste where these strange, forbidding plants struggle to exist. The reader gains an idea of the various groups of cacti, from the favorite Baby pincushion, a few inches high, to the shrubby, horrible Cholla, and from ugly, sprawling clumps of Caterpillar cactus to the commanding shafts of Sakuaro, or Giant cactus, fifty feet tall. Species are described in detail; photographs, line drawings, and colored plates aid as guides to identification.

Interwoven throughout this practical information is the haunting lure of the desert, its magic spell, its glowing sunsets and refreshing nights. Above all, however, is stressed the beauty and charm of texture, form and varied coloring displayed in the showy flowers of the wierd *Cactaceae;* the wonder that such lovely blossoms spring from armored stems which are peculiarly adapted to arid stretches of burning sand. ELSIE Z. LOVEGROVE

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ECONOMIC MAMMALOGY* Professor Henderson has already placed naturalists and out-of-doors folk in his debt by two previous works on "The Practical Value of Birds" (1927) and "Geology in Relation to Landscape" (1925). Our obligation is deepened by the book in hand, which was written jointly with Elberta L. Craig. Although man has had an interest in the mammals about him since the days of cave life, there has heretofore been only limited attempt to analyze and evaluate his relations to this important group of animals. Synoptic works on the economic relations of insects, fishes, birds, and plants abound on library shelves; but documents dealing with mammals are scattered and fragmentary, and heretofore have been, for the most part, easily accessible only to specialists.

The present work is essentially North American in scope, although there is frequent brief mention of economically important mammals in other parts of the world. Increasing density of human population in the United States and Canada, greater occupation of the land, modification of the environment by deforestation, drainage, reclamation, and agricultural practices, increase in the number of hunters, greater facility in penetrating wilderness areas, grazing and overgrazing, use of national parks and forests as recreation areas for urban populations, and various other factors, all have had their effect on native mammalian stocks. During the past four decades a wealth of detailed information has been recorded in scattered channels, dealing with the economic relations of the mammals of our land. The authors have addressed themselves to the task of cataloging and digesting this literature and rendering it up in form for convenient use and ready reference. And they have achieved a signal success. The book is easy to read, the material well organized in numerous short chapters replete with significant statistical and other detail, and is very

* *Economic Mammalogy.* By JUNIUS HENDERSON, Curator of University of Colorado Museum, and ELBERTA L. CRAIG, Museum Assistant. Charles C. Thomas, Springfield, Illinois, and Baltimore, Maryland. 1932. Pages, x+397. Price, $4.50.

well documented. Scarcely a page but carries from two to a dozen references, supporting the factual statements of the text, while the terminal bibliography of twenty-five pages (pp. 348-373) provides the reader with a guide to much of the important literature in the field. The book is divided almost equally into two parts, the first comprising twenty-eight chapters on general topics, the second a systematic treatment by orders and families of mammals, from monotremes and marsupials to monkeys.

Professor Henderson's earlier judicial experience is of manifest advantage in evaluating contested viewpoints on such matters as the controversies over control practices with carnivores and rodents, and in emphasizing the inadequacy of the evidence available in many cases. The interested reader who cares to follow such debated topics farther than the limitations of space in the book permit will find in the footnotes numerous references to papers representing the viewpoints of both parties in such issues.

Critically, the reviewer feels that the subject of mammal-borne diseases merited more extensive treatment than was accorded it; the plague situation with respect to ground-squirrels in California and the 1924-25 epidemic of hoof-and-mouth disease among the mule-deer of the central Sierra Nevada are not mentioned. Some of the data cited from the literature—as, for example, the numbers of jackrabbits taken in drives and used for food—should have been marked as indicating past rather than present conditions. Discussions of the food habits of moles (p. 191), based upon Hisaw's work in Kansas, do not emphasize sufficiently the percentage of vegetable materials freely taken by these animals in experimental feeding. But these and a few other similar omissions are after all relatively unimportant minutiæ when one considers the great amount of detail involved and the general success of the authors in synthesizing the scattered and incomplete materials which comprise their working sources.

Here then is a volume to which we may turn for facts concerning the economic relations of mammals. It is at once entitled to a place on the desk not only of the mammalogist, but of every amateur student of our native wild mammals and of the out-of-doors. TRACY I. STORER

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SKIING* To members of Sierra Club interested in skiing, two little books published last year should be of great help. Both are written by Americans, expert skiers themselves, who tell in a simple and direct manner the things a beginner wants to know about skiing. Each has a chapter on equipment. Although it is not so easy to learn turns from a book as it is through personal instruction, it can be done. These books are practical. I am not enough of a skier myself to recommend one of these books more than the other. Each has much material that the other does not have. The beginner can learn a great deal from either; the expert (if we have such among us)

* *Skiing.* By CHARLES N. PROCTER. Lakeview Press, Framingham, Massachusetts. 1932. 63 pages; illustrations. Paper covers. Price, $1.00.

Modern Ski Technique. By OTTO SCHNIEBS and JOHN W. MCCRILLIS. Stephen Daye Press, Brattleboro, Vermont. 1932. 103 pages; illustrations. Cloth bound. Price, $1.25.

will probably find most of his pleasure, as is customary with experts, in criticizing them. However, these books explain skiing according to the accepted present-day systems of teaching. They are small enough to slip in a pocket while practicing turns. Proctor's book is illustrated by diagrams and woodcuts. *Modern Ski Technique* is illustrated by photographs showing turns in their various stages. The increasing numbers who are making use of California's snow are sure to find help in these skiing manuals. GLEN DAWSON

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HISTORIC SPOTS IN CALIFORNIA* The colorful pageantry of the early days in California is forever fascinating, so those fond of history can look forward to spending several happy hours with "Historic Spots in California." Written with the hope of arousing interest in local history and of creating a desire for preserving existing landmarks, this excellent guide for tourists covers a period of time from 1542 up to the latter part of the nineteenth century. In an easy, readable fashion it treats of many topics: old trails of explorers and immigrants; Franciscan missions, Spanish pueblos, and presidial towns; vast Spanish and Mexican ranchos; the adventurous gold days; the heroic marches of covered-wagon immigrants; stage-coaches and Pony Express riders; pirates and trading ships; battles and fiestas; bandits and vigilantes. As the authors are issuing their work in sections, this volume centers attention upon the southern counties only.

It is evident that careful research has been carried on in collecting material for the book and that sincere efforts have been made to sift the truth from the many stories which, naturally, have grown up around historic places. Consequently, "Historic Spots in California" will prove of value as a reference-book, serving also as a fine stimulus for further reading on California's dramatic past. ETHEL BOULWARE

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FOREST EDUCATION† Here is a long-needed book which should be of intense interest to those who seek a comprehensive and authoritative summary of the work and opportunities in the profession of forestry and of the academic training necessary to anyone planning to enter this specialized field. In speaking of "Forest Education," a prominent forester said: "It will answer, as no other publication can, the myriad questions of the boy who would undertake to study forestry, of the parent who would open the doors of opportunity for his son, and of the teacher who so often is called upon to advise on questions of vocational guidance."

In one respect the book is disappointing to those who recognize the growing importance of recreation as a part of the management of forested areas and also of the field of wild-life administration. The former subject is given only very brief mention, and to the latter is devoted but two pages. This book is

* *Historic Spots in California. The Southern Counties.* By HERO EUGENE RENSCH and ETHEL GRACE RENSCH. Stanford University Press. 1932. Pages XXVII+267. Price, $2.50.

† *Forest Education.* By HENRY S. GRAVES and CEDRIC H. GUISE. Yale University Press, New Haven, Conn. 1932. 421 pages. Price, $2.50.

the result of a study made under the auspices of the Society of American Foresters and supported by a grant from the Carnegie Corporation. Its authors, Prof. Henry S. Graves, Dean of the School of Forestry at Yale University, and Prof. Cedric H. Guise, of Cornell University, are well-known in the field of forestry, and are especially well-qualified to present this analysis of the status of forest education in America. ANSEL FRANKLIN HALL

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REVISED GUIDE TO THE PAINTED DESERT* Strictly speaking, this is not a *new* publication, but an enlarged and improved edition of a former one. The book lives up to its sub-title, "A Guide." About a fourth of the space is devoted to preliminary information, systematically arranged so as to lay a foundation for a better understanding of what is met with when one is touring the region. These preliminary chapters treat of geography, climate, flora, fauna, geology, archeological history, Indians, and modern history. As might be expected, considerable space is given to an account of the tribes now making their home in the Painted Desert. These are mainly the Hopi and Navajo, but mention is made of the Havasupai and Yavapai, small tribes living to the west and southwest.

For many persons, the book will have particular value because of the information it contains on how to reach the points of interest in the region. In this it is full and explicit. There are four appendices, of which those on maps and on bibliography are especially useful. FRANCIS M. FULTZ

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A GUIDE TO THE TETON PEAKS† The Grand Teton, central figure of the national park bearing its name, is rated among mountaineers as one of the most attractive peaks in the United States. So rapidly has the sport of climbing grown to its present popularity that we have the extraordinary condition of a group of peaks, almost unknown a decade ago, now furnished with a thorough—one might as well say, exhaustive—guide-book. During the past few years Mr. Fryxell has made the Tetons his own. He has explored and climbed, and has searched the historical record very effectively. The Sierra Club is indebted to him for a contribution to the BULLETIN in 1931, on "An Ascent of the Middle Teton." Other articles and notes have appeared in *The American Alpine Journal* and in *Appalachia*. Those in the latter publication, written in systematic form as a climber's guide, have been revised and gathered into the present book. It is admirably designed for its purpose: to inspire the reader with a desire to climb, not one, but all the peaks of the range, and to render him all the assistance in fulfillment that could be asked. In addition to its merits as a guide, the book has narrative

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* *Days in the Painted Desert and the San Francisco Mountains: A Guide.* By HAROLD S. COLTON and FRANK C. BAXTER. Second Edition. Museum of Northern Arizona, Flagstaff. 1932. ix+113 pages; illustrations; maps. Price, $2.00.

† *The Teton Peaks and their Ascents.* By FRITIOF FRYXELL. The Crandall Studios, Grand Teton National Park, Wyoming. 1932. xiii+106 pages; illustrations; map. Price, $2.00.

and descriptive qualities which give it an assured place in the literature of the mountain regions of America. F. P. F.

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NEW MOUNTAINEERING JOURNAL* An enterprising and enthusiastic publisher in England has essayed to issue, without affiliation with any club, a journal devoted to mountaineering. The two numbers which have appeared, June and December, 1932, indicate that it has a place of its own in the scheme of things. Perusal of these numbers makes one eager for continuance. The plan is "to favor articles on technical subjects, topographical articles, particularly of lesser known districts, and really good reminiscences." If the article on "Modern Icecraft," in the December number, may be taken as an example of what is to come, the magazine will soon make itself indispensable. In many other respects it can be highly commended to mountain-climbers in this country as well as in Great Britain. In fact, the change of name from *The British Mountaineering Journal*, of the first issue, indicates a projected wider appeal. F. P. F.

* *The Mountaineering Journal.* Edited and published by CARL K. BRUNNING, 62-68 Chester Street, Birkenhead, England. Issued quarterly. Subscription at $2.50 per annum, received through Schultz News Agency, 112 West 44th Street, New York.

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OTHER BOOKS RECEIVED

Western Wild Flowers and Their Stories. By CHARLES FRANCIS SAUNDERS. Doubleday, Doran & Company, Inc., Garden City, New York. 1933. xiv+ 320 pages; illustrations. Price, $3.00.

"The plan has been to assemble facts respecting characteristic wild flowers of the Pacific States, and especially California, that are likely to be of interest to the general plant-lover, and particularly to that class which loves them for their esthetic graces and human associations rather than for their anatomical make-up and workings."

Scout Naturalists in the Rocky Mountains. By ALGER J. FAST, BOYNTON S. KAISER, DONALD G. KELLEY. Brewer, Warren & Putnam, Inc., New York. 1932. 220 pages; illustrations. Price, $1.75.

This is the account of the Second Scout Naturalist Expedition, which visited the Southwest, the Colorado Rockies, and the Yellowstone. These expeditions, organized by Ansel F. Hall, of the U. S. National Park Service, give to selected Scouts opportunities for participation in the educational work of the national parks.

Sonnets of the Sierra. By ISABELLA WILKIE. Printed by Johnck & Seeger, San Francisco. 1932. 16 pages; illustrations. Paper wrappers. Price, 60 cents.

Six sonnets, from "Daybreak" to "Night," dedicated "To those fine companions of the trail with whom I first encountered the wonders of the high Sierra." The frontispiece (a view of Mount Brewer) and the cover are designed by Marjory Dickieson.